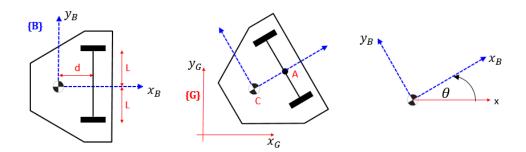
Derive the equations of motion of a Differential Drive Mobile Robot:

In this script we derive the equations of motion for a Differential Drive Robot (DDR). The approach taken is to apply Newton's second law. The modelling assumptions made, include:

- the vehicle can NOT slide in the direction of the BODY fixed Y-axis, ie: ${}^B_Gv_{\rm Ay}=0$.
- the wheels rotate without slipping.
- the vehicle is a 2 degree of freedom (dof) system, characterised by the orentation angle θ, and the velocity of the vehicle's centre of mass ^B_Gv_{Cx} along the X-axis of the vehicle's body frame.



Extensive use is made of the Symbolic toolbox throughout this derivation. After deriving the vehicle's equations of motion, these equations are automatically converted into a MATLAB function block for Simulink. This block can then be placed inside a Simulink model:

• bh_DDR_component_model.slx

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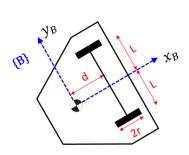
Equations of motion according to a body fixed frame:

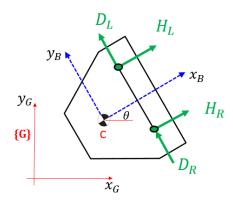
Recall our fundamental equations of motion for a RIGID body - these equations are expressed in the body fixed {B}-frame:

$${}^{B}F = m.({}^{B}_{G}a) = m.({}^{B}\dot{v} + {}^{B}\omega \times {}^{B}v)$$

$${}^{B}M = {}^{B}I.{}^{B}\dot{\omega} + {}^{B}\omega \times ({}^{B}I.{}^{B}\omega)$$

So let's explore our FORCE equation:





```
syms t theta(t) v_xB(t) v_yB(t) m

theta_dot = diff(theta(t), t);

w_B = sym([0,0,theta_dot]).';
v_B = [v_xB(t), v_yB(t), 0].';
v_B_dot = diff(v_B, t);
```

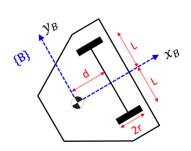
So our FORCE equation becomes:

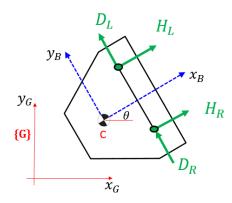
$$F_B = m*(v_B_dot + cross(w_B, v_B))$$

$$\begin{split} \mathbf{F}_{_\mathsf{B}} &= \\ & \left(m \, \left(\frac{\partial}{\partial t} \, v_{\mathsf{xB}}(t) - \overline{\frac{\partial}{\partial t}} \, \theta(t) \, \overline{v_{\mathsf{yB}}(t)} \right) \\ & m \, \left(\frac{\partial}{\partial t} \, v_{\mathsf{yB}}(t) + \overline{\frac{\partial}{\partial t}} \, \theta(t) \, \overline{v_{\mathsf{xB}}(t)} \right) \\ & 0 \end{split} \right) \end{split}$$

If we focus on the XY plane we see that the FORCE equations for our differential drive mobile robot is:

Similarly let's consider our MOMENT equation:



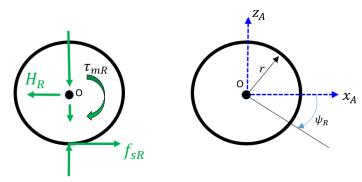


$$\begin{split} & \text{M_B} = \\ & \left(I_{\text{xz}} \frac{\partial^2}{\partial t^2} \, \theta(t) - \overline{\frac{\partial}{\partial t}} \, \theta(t)^2 \, \overline{I_{\text{yz}}} \right) \\ & \overline{\frac{\partial}{\partial t}} \, \theta(t)^2 \, \overline{I_{\text{xz}}} + I_{\text{yz}} \frac{\partial^2}{\partial t^2} \, \theta(t) \\ & I_{\text{zz}} \frac{\partial^2}{\partial t^2} \, \theta(t) \end{split} \right) \end{split}$$

If we focus on the rotational motion about the Z-axis, we see that the TORQUE equation for our differential drive mobile robot is:

Focus on RIGHT wheel:

Consider the free body diagram of the RIGHT side wheel:



where:

• r : the wheel's radius

 ullet ψ_R : the rotation angle of the wheel as measured from a body fixed frame at point A on the vehicle

• $f_{\rm sR}$: the static friction acting on the wheel

 H_R: the reaction force applied from the vehicle body to the wheel shaft. An equal and opposite force will be applied from the wheel shaft back onto the vehicle

 $au_{
m mR}$: the net torque applied to the wheel from an electric motor. $au_{
m mR}=K_a$. i-b. $\psi_R= au_{
m aR}-b$. ψ_R

• τ_{aR} : the applied motor torque (= $K_a.i$)

• K_a : the DC motor torque constant

• *i* : the DC motor curent

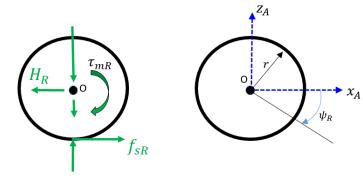
• b_R : the viscous damping co-efficient.

• m_R : the mass of the wheel

 ullet $I_{
m oR}$: the combined inertia of the wheel and the motor shaft

We're also going to assume that there is NO slipping of the wheel, ie:

•
$$x_o = r. \ \psi_R$$
 , $x_o = r. \ \psi_R$, $x_o = r. \ \psi_R$



So NEWTON's force law says:

$$m_R \mathbf{x}_o = \Sigma F = f_{\mathrm{sR}} - H_R$$

which we can write as:

$$m_R \cdot \mathbf{r} \cdot \psi_R = f_{\rm sR} - H_R$$

and then isolating $f_{\rm sR}$ we can write:

$$f_{\rm sR} = m_R \cdot r \cdot \psi_R + H_R \qquad$$
 (3.)

Next, let's explore NEWTON's torque law:

$$I_{\text{oR}}$$
. $\psi_R = \Sigma M = \tau_{\text{mR}} - r. f_{\text{sr}}$

and then isolating $f_{\rm sR}$ again we can write:

$$f_{\rm sR} = \left(\tau_{\rm mR} - I_{\rm oR} \cdot \psi_R\right) \frac{1}{r}$$
(4.)

so now we can equate (3.) and (4.) and then isolate \mathcal{H}_{R} :

$$f_{\rm sR} = m_R \cdot r \cdot \psi_R + H_R = \left(\tau_{\rm mR} - I_{\rm oR} \cdot \psi_R\right) \frac{1}{r}$$

and therefore we can express $H_{\rm R}$ as:

$$H_{\rm R} = \left(\tau_{\rm mR} - I_{\rm oR} \cdot \psi_R - m_R \cdot r^2 \cdot \psi_R\right) \frac{1}{r}$$

The last modification that we'll make to the $H_{
m R}$ equation is to make the following substitution for $au_{
m mR}$:

$$\tau_{\text{mR}} = K_a. i - b. \psi_R = \tau_{\text{aR}} - b. \psi_R:$$

Which then makes our H_R equation look like this:

•
$$H_{\rm R} = \left(\tau_{\rm aR} - b_R.\psi_R - I_{\rm oR}.\psi_R - m_R.r^2.\psi_R\right) \frac{1}{r}$$
 (5.)

$$f_{sR} = m_R \cdot r \cdot \psi_R + H_R$$

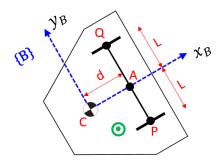
Now if we applied an identical analysis to the LEFT wheel, we would get:

•
$$f_{sL} = m_L \cdot r \cdot \psi_L + H_L$$

• $H_L = \left(\tau_{aL} - b_L \cdot \psi_L - I_{oL} \cdot \psi_L - m_L \cdot r^2 \cdot \psi_L\right) \frac{1}{r}$ (6.)

Explore velocities, accelerations and constraints:

Consider the following schematic:



we're going to explore the velocities and accelerations of points A,Q and P. Specifically we'll define:

$$_{G}^{B}\omega_{B}=\begin{bmatrix}0\\0\\\bullet\\\theta\end{bmatrix},\ _{G}^{B}\alpha_{B}=\begin{bmatrix}0\\0\\\bullet\\\theta\end{bmatrix},\ _{B}^{B}r_{A|C}=\begin{bmatrix}d\\0\\0\end{bmatrix},\ _{B}^{B}r_{Q|C}=\begin{bmatrix}d\\L\\0\end{bmatrix},\ _{B}^{B}r_{P|C}=\begin{bmatrix}d\\-L\\0\end{bmatrix}$$

Also, we'll enforce a "NO lateral sliding" motion contraint on our model. This constraint can be represented by enforcing a zero BODY Y axis velocity at point A on the vehicle ie:

$${}^{\bullet} {}_{G}^{B} v_{Av} = 0$$

Let's start with a clean slate:

```
clear
```

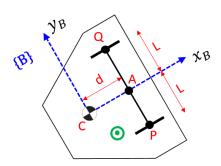
Define some symbols:

```
syms a_Cx a_Cy a_Cz
syms v_Cx v_Cy v_Cz
syms d L theta_DOT theta_DOT_DOT

v_C = [v_Cx, v_Cy, v_Cz].';
a_C = [a_Cx, a_Cy, a_Cz].';
omega = [0, 0, theta_DOT].';
alpha = [0, 0, theta_DOT_DOT].';

r_A = [d, 0, 0].';
r_Q = [d, L, 0].';
r_P = [d, -L, 0].';
```

For a rigid body, we know that we can describe the velocity of any point " \odot " iff we know information about the velocity of point C along with the ω of the body. And this relationship is described by the formula, where all vectors are expressed in components of the {B}-frame



$$_{G}^{B}v_{\odot} = _{G}^{B}v_{C} + (_{G}^{B}\omega_{B} \times _{B}^{B}r_{\odot|C})$$

Velocity of point A:

$$v_A = \begin{pmatrix} v_{Cx} \\ v_{Cy} + \overline{d} \overline{\theta_{DOT}} \\ v_{Cz} \end{pmatrix}$$

Velocity of point Q:

$$v_Q = v_C + cross(omega, r_Q)$$

$$v_{Q} = \begin{cases}
v_{Cx} - \overline{L} \, \overline{\theta_{DOT}} \\
v_{Cy} + \overline{d} \, \overline{\theta_{DOT}} \\
v_{Cz}
\end{cases}$$

Velocity of point P:

$$v_P = v_C + cross(omega, r_P)$$

$$v_{P} = \begin{pmatrix} v_{Cx} + \overline{L} \overline{\theta_{DOT}} \\ v_{Cy} + \overline{d} \overline{\theta_{DOT}} \\ v_{Cz} \end{pmatrix}$$

Now ifff we wanted ${}^{\it B}_{\it G} v_{\rm Ay} = 0$, then we would need to have:

$${}^{\bullet}_{G}v_{Cy} = -d. \stackrel{\bullet}{\theta}$$

So let's apply this constraint to our velocities for A,Q,P:

```
v_P = subs(v_P, v_Cy, -d*theta_DOT);
```

So our velocities now look like this:

v_A

$$v_A = \left(\frac{v_{Cx}}{d\theta_{DOT} - d\theta_{DOT}}\right)$$

v_Q

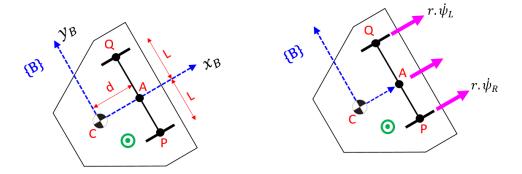
$$v_{Q} = \begin{cases}
v_{Cx} - \overline{L} \, \overline{\theta_{DOT}} \\
\overline{d} \, \overline{\theta_{DOT}} - d \, \theta_{DOT}
\end{cases}$$

$$v_{Cz}$$

v_P

$$v_{P} = \begin{pmatrix} v_{Cx} + \overline{L} \overline{\theta_{DOT}} \\ \overline{d} \overline{\theta_{DOT}} - d \theta_{DOT} \\ v_{Cz} \end{pmatrix}$$

There is something else we can say about the velocities of points A,P,Q ... and that's their relationship with the wheel rotation velocities $\stackrel{\bullet}{\psi_L}$ and $\stackrel{\bullet}{\psi_R}$:



So what we have is:

And we can solve this set of equations. so solving for $\overset{\bullet}{\theta}$ and $\overset{B}{G}_{C_X}$:

```
v_sol_1 = solve([EQ_vQ, EQ_vP], [theta_DOT, v_Cx]);
```

so here's $\overset{\bullet}{\theta}$:

```
the_theta_DOT = v_sol_1.theta_DOT  
the_theta_DOT =  -\frac{\overline{\psi_{L,\text{DOT}}}\,\overline{r} - \overline{\psi_{R,\text{DOT}}}\,\overline{r}}{2\,L}
```

so here's ${}_{G}^{B}v_{Cx}$:

the_v_Cx = v_sol_1.v_Cx
the_v_Cx =
$$\frac{\psi_{L,DOT} r}{2} + \frac{\psi_{R,DOT} r}{2}$$

And similarly we could solve for $\stackrel{\bullet}{\psi_{\scriptscriptstyle R}}$ and $\stackrel{\bullet}{\psi_{\scriptscriptstyle L}}$:

so here's ψ_R :

```
the_psi_R_DOT = v_sol_2.psi_R_DOT

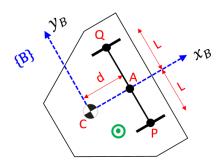
the_psi_R_DOT = v_{Cx} + \overline{L} \overline{\theta_{DOT}}
```

so here's ψ_L :

the_psi_L_DOT = v_sol_2.psi_L_DOT

the_psi_L_DOT =
$$v_{Cx} - \overline{L} \overline{\theta_{DOT}}$$

Next let's explore **Accelerations**. Again here is our system schematic:



For a rigid body, we know that we can describe the acceleration of any point " \odot " iff we know information about the acceleration of point C along with the ω and α of the body. And this relationship is described by the formula, where all vectors are expressed in components of the {B}-frame

•
$${}^{B}_{G}a_{\odot} = {}^{B}_{G}a_{C} + ({}^{B}_{G}\alpha_{B} \times {}^{B}_{B}r_{\odot|C}) + {}^{B}_{G}\omega_{B} \times ({}^{B}_{G}\omega_{B} \times {}^{B}_{B}r_{\odot|C})$$

Acceleration of point A:

a_A = a_C + cross(alpha, r_A) + cross(omega, cross(omega, r_A))
a_A =
$$\begin{pmatrix} a_{\rm Cx} - d \, \theta_{\rm DOT} \, \overline{\theta_{\rm DOT}} \\ a_{\rm Cy} + \overline{d} \, \overline{\theta_{\rm DOT, DOT}} \\ a_{\rm Cz} \end{pmatrix}$$

Acceleration of point Q:

$$a_Q = a_C + cross(alpha, r_Q) + cross(omega, cross(omega, r_Q))$$

$$a_Q = \begin{pmatrix} a_{Cx} - \overline{L} \overline{\theta_{DOT,DOT}} - d \theta_{DOT} \overline{\theta_{DOT}} \\ a_{Cy} + \overline{d} \overline{\theta_{DOT,DOT}} - L \theta_{DOT} \overline{\theta_{DOT}} \\ a_{Cz} \end{pmatrix}$$

Acceleration of point P:

a_P = a_C + cross(alpha, r_P) + cross(omega, cross(omega, r_P))

$$a_P = \begin{pmatrix} a_{Cx} + \overline{L} \overline{\theta_{DOT,DOT}} - d \theta_{DOT} \overline{\theta_{DOT}} \\ a_{Cy} + \overline{d} \overline{\theta_{DOT,DOT}} + L \theta_{DOT} \overline{\theta_{DOT}} \\ a_{Cz} \end{pmatrix}$$

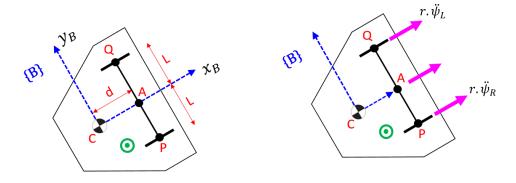
We can insert into these acceleration expressions what we now know about ${}^B_{G}v_{Cy}$ and ${}^B_{G}a_{Cx}$:

•
$${}_{G}^{B}a_{Cx} = {}_{G}^{B}\dot{v}_{Cx} - \dot{\theta}.{}_{G}^{B}v_{Cy}$$

$${}^{\bullet}_{G}v_{Cy} = -d. \ \theta$$

$$\begin{array}{c} \mathbf{a}_{\mathbf{P}} = \\ \begin{pmatrix} v_{\mathrm{Cx,DOT}} + d \; \theta_{\mathrm{DOT}}^{2} + \overline{L} \; \overline{\theta_{\mathrm{DOT,DOT}}} - d \; \theta_{\mathrm{DOT}} \; \overline{\theta_{\mathrm{DOT}}} \\ a_{\mathrm{Cy}} + \overline{d} \; \overline{\theta_{\mathrm{DOT,DOT}}} + L \; \theta_{\mathrm{DOT}} \; \overline{\theta_{\mathrm{DOT}}} \\ a_{\mathrm{Cz}} \end{pmatrix} \end{array}$$

There is something else we can say about the accelerations of points A,P,Q ... and that's their relationship with the wheel rotation accelerations ψ_L and ψ_R :



So what we have is:

```
syms r psi_L_DOT_DOT psi_R_DOT_DOT

EQ_aQ = r*psi_L_DOT_DOT == a_Q(1);
EQ_aP = r*psi_R_DOT_DOT == a_P(1);
```

And we can solve this set of equations. Solving for ψ_R and ψ_L :

```
a_sol_2 = solve([EQ_aQ, EQ_aP], [psi_R_DOT_DOT, psi_L_DOT_DOT]);
```

so here's ψ_L :

```
the_psi_L_DOT_DOT = a_sol_2.psi_L_DOT_DOT  
the_psi_L_DOT_DOT =  v_{\text{Cx,DOT}} + d \theta_{\text{DOT}}^2 - \overline{L} \overline{\theta_{\text{DOT,DOT}}} - d \theta_{\text{DOT}} \overline{\theta_{\text{DOT}}}
```

so here's ψ_R :

Continue with the EOMs:

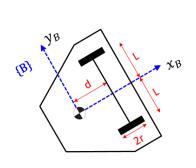
Now that we've defined some key relationships, we can revisit our equations of motion. First let's clear away some of our workspace variables ... and keep some:

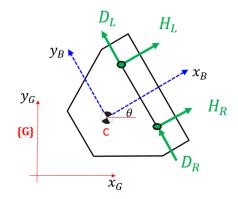
```
clearvars -except L r d a_sol_2 v_sol_2 a_Cx v_Cx theta_DOT theta_DOT_DOT
```

Define some new SYMS:

```
syms theta v_Cx v_Cx_DOT
syms theta TaL TaR bR bL
syms I_zz I_wR I_wL m m_wR m_wL
```

Recall the Newtons equations that we derived earlier:





$$\begin{bmatrix}
{}^{B}F_{X} \\
{}^{B}F_{Y}
\end{bmatrix} = \begin{bmatrix}
H_{R} + H_{L} \\
D_{R} + D_{L}
\end{bmatrix} = m. \begin{bmatrix}
{}^{B}a_{Cx} \\
{}^{G}a_{Cy}
\end{bmatrix} = m. \begin{bmatrix}
{}^{B}\dot{v}_{Cx} - \dot{\theta}. {}^{B}v_{Cy} \\
{}^{B}\dot{v}_{Cy} + \dot{\theta}. {}^{B}v_{Cx}
\end{bmatrix}$$

$$M_{\rm zB} = d. (D_L + D_R) + L. (H_R - H_L) = I_{\rm zz}. \theta$$

So now we can combine some of the key results and substitute them into our original equations of motion analysis. The key relations that we derived were:

$${}^{\bullet}_{G} {}^{B} v_{Cy} = -d. \ \theta \quad \text{and} \quad {}^{B}_{G} \dot{v}_{Cy} = -d. \ \theta$$

$$\begin{bmatrix}
{}^{B}_{G}a_{Cx} \\
{}^{B}_{G}a_{Cy}
\end{bmatrix} = \begin{bmatrix}
{}^{B}_{G}\dot{v}_{Cx} - \dot{\theta} \cdot {}^{B}_{G}v_{Cy} \\
{}^{B}_{G}\dot{v}_{Cy} + \dot{\theta} \cdot {}^{B}_{G}v_{Cx}
\end{bmatrix}$$

$$\overset{\bullet}{\psi}_{R} = \begin{pmatrix} {}_{B}v_{\mathrm{Cx}} + L. \overset{\bullet}{\theta} \end{pmatrix} \frac{1}{r} \quad \text{and} \quad \overset{\bullet}{\psi}_{L} = \begin{pmatrix} {}_{B}v_{\mathrm{Cx}} - L. \overset{\bullet}{\theta} \end{pmatrix} \frac{1}{r}$$

•
$$\psi_R = \left(-d. \, \theta^2 + {}_{G}^{B} a_{\text{Cx}} + L. \, \theta \right) \frac{1}{r}$$

$$\psi_L = -\left(d. \frac{\bullet}{\theta^2} - \frac{B}{G} a_{\text{Cx}} + L. \frac{\bullet}{\theta}\right) \frac{1}{r}$$

•
$$H_R = \left(\tau_{aR} - b_R \cdot \psi_R - I_{oR} \cdot \psi_R - m_R \cdot r^2 \cdot \psi_R\right) \frac{1}{r}$$

$$^{\bullet} \ H_L = \left(\tau_{\mathrm{a}L} - b_L \cdot \psi_L - I_{\mathrm{o}L} \cdot \psi_L - m_L \cdot r^2 \cdot \psi_L \right) \frac{1}{r}$$

HR = (TaR -bR*my_psi_R_DOT - I_wR*my_psi_R_DOT_DOT - m_wR*(r^2)*my_psi_R_DOT_DOT)/r;
HL = (TaL -bL*my_psi_L_DOT - I_wL*my_psi_L_DOT_DOT - m_wL*(r^2)*my_psi_L_DOT_DOT)/r;
%NOTE: the resulting solutions for v_Cx_DOT, theta_DOT_DOT are greatly simplified
% when you make the masses and inertias of the 2 wheels the same.

```
%HL = (TaL -bL*my_psi_L_DOT - I_wR*my_psi_L_DOT_DOT - m_wR*(r^2)*my_psi_L_DOT_DOT)/r;
```

So let's define one equation - and it will be the ${}^B\!F_{\nu}$ equation:

$$\bullet \begin{bmatrix} {}^{B}F_{X} \\ {}^{B}F_{Y} \end{bmatrix} = \begin{bmatrix} H_{R} + H_{L} \\ D_{R} + D_{L} \end{bmatrix} = m. \begin{bmatrix} {}^{B}G_{Cx} \\ {}^{G}G_{Cx} \end{bmatrix} = m. \begin{bmatrix} {}^{B}\dot{v}_{Cx} - \dot{\theta}. {}^{B}G_{Cy} \\ {}^{B}\dot{v}_{Cy} + \dot{\theta}. {}^{B}G_{Cy} \end{bmatrix}$$

```
EQ_F = (HR + HL) == (m * my_a_Cx);
```

For the 2nd equation, we'll focus on our moment equation ... where we'll substiture the $(D_L + D_R)$ term with our $(m, {}^B_G a_{Cv})$ relationship :

```
• M_{\rm zB} = d.(D_L + D_R) + L.(H_R - H_L) = I_{\rm zz}.\theta
```

```
DR_plus_DL = m*my_a_Cy;
EQ_M = (d*DR_plus_DL + L*(HR-HL)) == (I_zz*theta_DOT_DOT);
```

So can we solve for $\overset{\bullet\bullet}{\theta}$ and $\overset{B}{G}\dot{v}_{\mathrm{Cx}}$:

```
S = solve([EQ_F, EQ_M], [v_Cx_DOT, theta_DOT_DOT])
```

```
Warning: Solutions are valid under the following conditions: (real(L)*((imag(m wL)*(imag(r)^4
      + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(m wL)*(4*imag(r)*real(r)^3 + real(m wL)*(4*imag(r)*real(r)^3 + real(m wL)*(4*imag(r)*real(m wL))*(4*imag(r)*real(m wL))*(4*imag(r)*real(m wL))*(4*imag(m wL)*(4*imag(m wL))*(4*imag(m wL))*
      4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m_wL)*(imag(r)^4))
      + real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(m_wL)*(4*imag(r)*real(r)^3 -
      4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m))) - (imag(m)*(imag(r)^2)
        -\  \, real(r)\,^2)\  \, -\  \, 2*imag(r)\,^*real(m)\,^*real(r))\,^*(real(I_wL)\,^*(imag(d)\,^2\  \, -\  \, real(d)\,^2)
      + 2*imag(I_wL)*imag(d)*real(d)) - (real(m)*(imag(r)^2 - real(r)^2) +
       2*imag(m)*imag(r)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I_wL)*imag(d)*real(d))
      - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I_wR)*(imag(d)^2)
      - real(d)^2) + 2*imag(I wR)*imag(d)*real(d)) - (real(m)*(imag(r)^2 - real(r)^2) + (real(m))*(imag(r)^2 - real(m))*(imag(r)^2 - real(m))*
      2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
        -4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
       real (m wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(L)*real(m wL) +
        real (L) *imag(m wL)) + (real (m wR) * (imag(r) ^4 + real (r) ^4 - 6*imag(r) ^2*real (r) ^2)
        -imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - 4*imag(r)^3*real(r))
        real(L)*real(m wL))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(m wR))
        (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
        -4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) - ((imag(d)^2 - imag(m)))
        real(d)^2 * (imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))* (4*imag(r)*real(r)^3 - 4*imag(d)*real(d)*imag(m)*real(m))* (4*imag(n)*real(n))* (4*imag(n)*real(n)* (4*imag(n)*real(n))* (4*imag(n)*real(n)*real(n)* (4*imag(n)*real(n)*real(n)* (4*imag(n)*real(n)* (4*imag(n)*re
        4*imag(r)^3*real(r)) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 6*imag(r)^2*real(r)^4 + 6*imag(r)^4 + 6*imag
       real (m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m WL) - real(L)*real(m WL))
                   (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
        - 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + imag(L)*((imag(m)*(imag(r)^2
        - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
      + \; (\text{real}(\text{m}) * (\text{imag}(\text{r}) ^2 - \text{real}(\text{r}) ^2) \; + \; 2* \text{imag}(\text{m}) * \text{imag}(\text{r}) * \text{real}(\text{r})) * (\text{imag}(\text{I}_{\text{wL}}) * \text{imag}(\text{L})) * (\text{imag}(\text{I}_{\text{wL}}) * \text{imag}(\text{L})) * (\text{imag}(\text{I}_{\text{wL}}) * \text{imag}(\text{I}_{\text{wL}}) * \text{imag}(\text{I}_{\text{wL
        - real(I_wL)*real(L))) + imag(L)*((imag(m)*(imag(r)^2 - real(r)^2) - real(r)^2)
       2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) + imag(L)*real(I_wR)
         (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wR)*imag(L)) 
        - real(I wR) * real(L))) + 4*imag(L) * ((imag(m wL) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r)
       2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) + imag(L)*real(I_wR)) + imag(L)*real(I_wR) + imag(L)*real(I_w
          (real(m_wL)*(imag(r)^2 - real(r)^2) + 2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*imag(L))
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- real(I_wR) * real(L))) + 4*imag(L) * ((imag(m_wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r)
 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) +
 - real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) -
 (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
 - \text{real}(I \text{ wL}) * \text{real}(L))) + \text{real}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) -
 (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
 - real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
 (imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
 - real(I wR)*real(L))) + 4*real(L)*((real(m wR)*(imag(r)^2 - real(r)^2) +
 2*imag(m WR)*imag(r)*real(r))*(imag(I WL)*real(L) + imag(L)*real(I WL)) - (imag(m WR)*(imag(r)^2 - (imag(m WR))*(imag(m 
 - real(r)^2 - 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) - real(I wL)*real(L)))
  (imag(I zz)*real(m) + real(I zz)*imag(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
  (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 - 6*im
  (imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(r)^4 + re
 (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4
 + \; real(r)^4 \; - \; 6*imag(r)^2*real(r)^2) \; + \; (imag(I_wL)*real(I_zz) \; + \; imag(I_zz)*real(I_wL))*(imag(r)^2 \; + \; imag(I_wL))*(imag(r)^2 \; + \; imag(r)^2 \; +
 - \  \, real(r)^2) \ + \ (imag(I_wR) * real(I_zz) \ + \ imag(I_zz) * real(I_wR)) * (imag(r)^2 \ - \ real(r)^2) \ + \ imag(I_wR) * (imag(r)^2 \ - \ real(r)^2) \ + \ imag(I_wR) * (imag(r)^2 \ - \ real(r)^2) \ + \ imag(I_wR) * (imag(r)^2 \ - \ real(r)^2) \ + \ imag(I_wR) * (imag(r)^2 \ - \ real(r)^2) \ + \ imag(I_wR) * (imag(r)^2) \ + \ imag
 (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
 (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) + (imag(m)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) + (imag(m)^2 - real(d)^2) - (imag
 (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m_wR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 4*imag(r)^3*real(r))
4*abs(L)^2*(imag(I wL)*real(I wR) + imag(I wR)*real(I wL)) - imag(L)*((imag(m wL)*(imag(r)^4 WL)) + imag(I wL)) + imag(I wL) + imag(I
 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 -
 4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)^4) + (real(m wL)*(imag(r)^4 + real(r)^4) + (real(m wL)*(imag(m))*(imag(m))^4 + (real(m))*(imag(m))^4 + (real(m))*(imag(m))^4 + (real(m))^4 + (real(m
 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m)
 - \text{ real}(L) \text{ *real}(m))) - \text{ imag}(L) \text{ *}((\text{imag}(m \text{ wR}) \text{ *}(\text{imag}(r)^4 + \text{real}(r)^4 - 6\text{*imag}(r)^2\text{*real}(r)^2))
 + real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + 4*imag(L)*real(m) + 4*imag(L)*re
 real(L)*imag(m)) + (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(r)^3*real(r)))*(imag(r)*imag(m) - 4*imag(r)*imag(m) - 4*imag(m) - 
 real(L)*real(m))) + (imag(I_zz)*imag(m) - real(I_zz)*real(m))*(4*imag(r)*real(r)^3 - real(L)*real(m))*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* + (1.5)*(1.5)* 
 4*imag(r)^3*real(r) + (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + (imag(I_zz)*imag(m_wR) - real(I_zz)*real(m_wR))*(4*imag(r)*real(r)^3 + real(r)^3 + real(
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I_wL)*imag(I_zz) - real(I_wL)*real(I_zz))
 + 2*imag(r)*real(r)*(imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz)))*((imag(m)*(imag(r)^2))
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(real(I_wL)*(imag(d)^2 - real(d)^2)
 + 2*imag(I wL)*imag(d)*real(d)) - 4*imag(L)*((imag(m wR)*(imag(r)^4 + 2*imag(I)*(imag(m wR))*(imag(m wR))*(
 real(r)^4 - 6*imag(r)^2*real(r)^2 + real(m wR)*(4*imag(r)*real(r)^3 - real(r)^4 + real(r
 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL)) + (real(m wR)*(imag(r)^4
 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3 - imag(m)^4 - 6*imag(r)^2*real(r)^3 - imag(m)^4 - 6*imag(r)^4 - 6*ima
4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + (real(m)*(imag(r)^2 - real(r)^2)
 + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
 + (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I wR)*(imag(d)^2)
 - real(d)^2 + 2*imag(I wR)*imag(d)*real(d) + (real(m)*(imag(r)^2 - real(r)^2) +
 2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
 + real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) + 4
 \label{eq:real_mag} \texttt{real(L)*real(m))} \ - \ (\texttt{real(m_wL)*(imag(r)^4} \ + \ \texttt{real(r)^4} \ - \ \texttt{6*imag(r)^2*real(r)^2})
 -imag(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + 4*imag(m)*real(m) + 4*imag(m) + 
 real(L)*imag(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR)*(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^4)) + real(L)*(imag(m wR)*(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 + r
  real (m_wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(L)*imag(m) - real(L)*real(m)) - real(L) * (m_wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*imag(m) - real(L)*real(m)) - real(L)*real(m) + real(m)*real(m) + real(m)*real(m)*real(m) + real(m)*real(m)*real(m) + real(m)*real(m)*real(m)*real(m)*real(m) + real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) + ((imag(d)^2 - 4*imag(m))))
 real(d)^2 (imag(m)^2 - real(m)^2 - rea
 4*imag(r)^3*real(r)) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 6*imag(r)^2*real(r)^4 + 6*imag(r)^4 + 6*imag
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))
 - (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r)))*(imag(L)*real(m_wL) + real(L)*imag(m_wL))) + imag(L)*((imag(m)*(imag(r)^2)))
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- \ \text{real}(\texttt{r}) \ ^2) \ - \ 2 \times \text{imag}(\texttt{r}) \times \text{real}(\texttt{m}) \times \text{real}(\texttt{r})) \times (\text{imag}(\texttt{I}\_\texttt{wL}) \times \text{real}(\texttt{L}) + \text{imag}(\texttt{L}) \times \text{real}(\texttt{I}\_\texttt{wL}))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) + imag(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR) * real(L))) + 4* imag(L) * ((imag(m wL) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2) - real(r)^2 - real(
2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((imag(m wR)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) +
 (\text{real}(\text{m_wR}) * (\text{imag}(\text{r}) ^2 - \text{real}(\text{r}) ^2) + 2* \text{imag}(\text{m_wR}) * \text{imag}(\text{r}) * \text{real}(\text{r})) * (\text{imag}(\text{I_wL}) * \text{imag}(\text{L}) - \text{real}(\text{r})) * (\text{imag}(\text{I_wL}) * \text{imag}(\text{L})) + (\text{imag}(\text{I_wL}) * \text{imag}(\text{I_wL}) * \text{imag}(\text{I_wL})) * (\text{imag}(\text{I_wL}) * (\text{imag}(\text{I_wL})) * (\text{imag}(\text{I
real(I wL)*real(L))) - 4*imag(L)*(imag(L)*(imag(I wL)*real(I wR) + imag(I wR)*real(I wL))
+ real(L)*(imag(I wL)*imag(I wR) - real(I wL)*real(I wR))) + real(L)*((real(m)*(imag(r)^2
- real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
             (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- \text{real}(I \text{ wL}) * \text{real}(L))) + \text{real}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
- real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
 2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - \\
(imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*imag(L))
- real(I wR) * real(L))) + 4 * real(L) * ((real(m wR) * (imag(r)^2 - real(r)^2) + (imag(r)^2 - real(r)^2)) + (imag(r)^2 - real(r)^2) + (imag(r)^2 
2*imag(m WR)*imag(r)*real(r))*(imag(I WL)*real(L) + imag(L)*real(I WL)) - (imag(m WR)*(imag(r)^2 L) - (imag(m WR))*(imag(m WR))*(imag
- real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) +
+ imag(I_wR)*real(I_wL))) + (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(imag(r)^4 + real(r)^4)
-6*imag(r)^2*real(r)^2) + (imag(I_zz)*real(m_wL) + real(I_zz)*imag(m_wL))*(imag(r)^4 + real(I_zz)*imag(m_wL))*(imag(r)^4 + real(I_zz)*imag(m_wL))*(imag(r)^4 + real(m_wL))*(imag(r)^4 + real(m_wL))*(imag(r)^4 + real(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(im
 real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(I_zz)*imag(m_wR)*(imag(r)^4 + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(I_zz)*imag(m_wR)*(imag(r)^4 + real(I_zz)*im
+ real(r)^4 - 6*imag(r)^2*real(r)^2 - (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + (2*imag(m)^2 - real(m)^2) + (2*imag(
2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
- (imag(I wL)*real(I zz) + imag(I zz)*real(I wL))*(imag(r)^2 - real(r)^2)
- (imag(I wR))*real(I zz) + imag(I zz)*real(I wR))*(imag(r)^2 - real(r)^2) -
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) -
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r)))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)*real(m)) - 2*imag(d)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*real(m)*re
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) -
(real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m))
-imag(L)*((imag(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m
(real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) - imag(L)*((imag(m wR)*(imag(r)^4)))
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)*real(r)^3 + 6*imag(r)^3 + 6*ima
4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - real(m)^4) + (real(m wR)*(imag(r)^4 + real(r)^4) + (real(m)^4)*(imag(m)^4) + (real(m)^4) + (real(m)^4)*(imag(m)^4) + (real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*imag(m)
- real(L)*real(m))) - (imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r) - (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) - (imag(Izz)*imag(mwR) - real(Izz)*real(mwR))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) - 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz))
-2*imag(r)*real(r)*(imag(I wR)*imag(I zz) - real(I wR)*real(I zz))) +
(4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
- (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r)*real(r)^3 - imag(m_wR)*(4*imag(r))^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r))^4 - 6*imag(r)^4 - 6*i
4*imag(r)^3*real(r)))*(imag(L)*real(m_wL) + real(L)*imag(m_wL))) + (imag(m)*(imag(r)^2 - real(r)^2))
- 2*imag(r)*real(m)*real(r))*(imag(I wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
- (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wL)*(imag(d)^2)
- real(d)^2 + 2*imag(I wL)*imag(d)*real(d) + (imag(m)*(imag(r)^2 - real(r)^2) - (imag(m))*(imag(m))^2 - real(m)^2 - real(m)^
2*imag(r)*real(m)*real(r))*(imag(I_wR)*(imag(d)^2 - real(d)^2) - 2*real(I_wR)*imag(d)*real(d))
- (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I wR)*(imag(d)^2 - real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(
 real(d)^2) + 2*imag(I_wR)*imag(d)*real(d)) + real(L)*((imag(m_wL)*(imag(r)^4 + real(r)^4 - real(d))) + real(d)*((imag(m_wL))*(imag(r)^4 + real(d))) + real(d)*((imag(m_wL))*(imag(r))*((imag(m_wL))*(imag(r))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))*((imag(m_wL))
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ \text{ real}(L) * imag(m)) + (real(m wL) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2)
-imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m)^3*real(m)))*(imag(L)*imag(m) - 4*imag(m)^3*real(m)))*(imag(L)*imag(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*
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real(L)*real(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + real(L)*imag
(real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) - (2*imag(d)*real(d)*(imag(m)^2)
- \text{ real (m) }^2 + 2 \times \text{imag (m) } \times \text{real (m) } \times \text{(imag (d) }^2 - \text{ real (d) }^2) \times (4 \times \text{imag (r) } \times \text{real (r) }^3 - \text{real (m) }^2
4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real (m wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*real(m wL) + real(L)*imag(m wL))
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2))
- real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) + imag(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
- real(I wR)*real(L))) + 4*imag(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L)
- \text{real}(I \text{ wR}) * \text{real}(L))) + 4* \text{imag}(L) * ((\text{real}(m \text{ wR}) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
(imag(m_wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*imag(L))
- \text{real}(I \text{ wL}) * \text{real}(L))) - \text{real}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) - \text{real}(r)^2)
2*imag(r)*real(m)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L))
- real(I wL)*real(L))) - real(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) - 4*real(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) - 4*real(L)*((imag(m wR)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) + (real(m wR)*(imag(r)^2
- \  \, real(r)^2) \ + \ 2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*imag(L) \ - \ real(I_wL)*real(L))) \ + \  \, 1*imag(m_wR)*imag(r)*real(L)) + \  \, 1*imag(m_wR)*imag(r)*real(L)) + \  \, 1*imag(m_wR)*imag(m_wR)*imag(r)*real(R)) + \  \, 1*imag(m_wR)*imag(m_wR)*imag(r)*real(R)) + \  \, 1*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*imag(m_wR)*im
 (imag(I_zz)*imag(m) - real(I_zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*imag(m) - real(I_zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*imag(m) - real(I_zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(r)^4 + real(r)^4 - 6*imag(r)^4)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4) + (imag(r)^4 + real(r)^4) + 
 (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 (imag(I zz)*imag(m wR) - real(I zz)*real(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - 6*imag(m wR)
 ((imag(d)^2 - real(d)^2) * (imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m)) * (imag(r)^4) + (imag(d)^2) * (imag(m)^2) + (imag(m)
+ real(r)^4 - 6*imag(r)^2*real(r)^2) - (imag(I wL)*imag(I zz) - real(I wL)*real(I zz))*(imag(r)^2
- real(r)^2) - (imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz))*(imag(r)^2 - real(r)^2) - real(r)^2
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
 - 4*imag(r)^3*real(r)))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) - 4*imag(r)^3*real(d)*imag(m)) - 4*imag(d)*real(d)*imag(m)) - 4*imag(d)*real(d)*imag(m)) - 4*imag(d)^2*imag(d)*real(d)*imag(m)) - 4*imag(d)^2*imag(d)*real(d)*imag(m)) - 4*imag(d)^3*real(d)*imag(d)*real(d)*imag(m)) - 4*imag(d)*real(d)*imag(m)) - 4*imag(d)*imag(d)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*imag(d)*real(d)*imag(m)) - 4*imag(d)*imag(d)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)) - 4*imag(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*imag(m)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
4*abs(L)^2*(imag(I_wL)*imag(I_wR) - real(I_wL)*real(I_wR)) + imag(L)*((imag(m_wL)*(imag(r)^4)) + imag(L)*((imag(m_wL)*(imag(m_wL))*(imag(r)^4)) + imag(L)*((imag(m_wL)*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(m)^4 - 6*imag(r)^4 + real(m)^4 - 6*imag(m)^4 - 6*i
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
+ \text{ real}(L) * \text{imag}(m))) + \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2))
+ real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) + 4*imag(m) +
real(L)*real(m)) - (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
\texttt{real}(\texttt{L}) * \texttt{imag}(\texttt{m}))) + (\texttt{imag}(\texttt{I}\_\texttt{zz}) * \texttt{real}(\texttt{m}) + \texttt{real}(\texttt{I}\_\texttt{zz}) * \texttt{imag}(\texttt{m})) * (4* \texttt{imag}(\texttt{r}) * \texttt{real}(\texttt{r}) ^ 3 - \texttt{real}(\texttt{m}) + \texttt{re
4*imag(r)^3*real(r) + (imag(I_zz)*real(m_wL) + real(I_zz)*imag(m_wL))*(4*imag(r)*real(r)^3
- 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) + 2*imag(r)*real(r)*(imag(I_wL)*real(I_zz) +
imag(I zz)*real(I wL)) + 2*imag(r)*real(r)*(imag(I wR)*real(I zz) +
imag(I_zz)*real(I_wR)))*(4*imag(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4) + (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4) + (imag(m_wR)*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m
real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))
- (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3 - imag(m WR)*(4*imag(r))^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r))^4 - 6*imag(r)^4 - 6*i
4*imag(r)^3*real(r)))*(imag(L)*real(m_wL) + real(L)*imag(m_wL))) - (imag(m)*(imag(r)^2 - real(r)^2))
-2*imag(r)*real(m)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I_wL)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wL)*(imag(d)^2)
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- real(d)^2 + 2*imag(I_wL)*imag(d)*real(d) - (imag(m)*(imag(r)^2 - real(r)^2) - (imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(ima
2*imag(r)*real(m)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I wR)*(imag(d)^2 - real(r)^2)
real(d)^2 + 2*imag(I wR)*imag(d)*real(d) + real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - real(d)^2))
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ \text{ real}(L) * \text{imag}(m)) + (\text{real}(m wL) * (\text{imag}(r)^4 + \text{real}(r)^4 - 6* \text{imag}(r)^2* \text{real}(r)^2)
-imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
real(L)*real(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m \ wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) + (2*imag(d)*real(d)*(imag(m)^2)
- \text{ real (m) }^2 + 2 \text{ imag (m) * real (m) * (imag (d) }^2 - \text{ real (d) }^2)) * (4 \text{ imag (r) * real (r) }^3 - \text{ real (m) }^3
4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 6*imag(r)^4 + 6*imag(r)^4 + 6*imag(r)^4 + 6*imag(r)^4
real (m wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*real(m wL) + real(L)*imag(m wL))
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
- 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2
- real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
       (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- \text{real}(I \text{ wL}) * \text{real}(L))) + \text{imag}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
- real(I wR) * real(L))) + 4*imag(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((real(m wR)*(imag(r)^2 - real(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
(imag(m wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*imag(L) - 2*imag(m wR)*real(r))*(imag(r)^2 - real(r)^2)
real(I wL)*real(L))) + 4*imag(L)*(imag(L)*(imag(I wL)*imag(I wR) - real(I wL)*real(I wR))
- real(L)*(imag(I wL)*real(I wR) + imag(I wR)*real(I wL))) - real(L)*((imag(m)*(imag(r)^2
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) - real(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) - 4*real(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) - 4*real(L)*((imag(m wR)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) + \\
 (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L) - real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(ima
real(I_wL)*real(L))) + 4*real(L)*(imag(L)*(imag(I_wL)*real(I_wR) + imag(I_wR)*real(I_wL)) + imag(I_wR)*real(I_wL)) + imag(I_wR)*real(I_wL) + imag(I_wR)*real(I_wL) + imag(I_wR)*real(I_wL) + imag(I_wR)*real(I_wR) + imag(I_wR) + imag(I_wR)
+ \ \operatorname{real}(\mathtt{L}) * (\operatorname{imag}(\mathtt{I}_{\mathtt{wL}}) * \operatorname{imag}(\mathtt{I}_{\mathtt{wR}}) \ - \ \operatorname{real}(\mathtt{I}_{\mathtt{wL}}) * \operatorname{real}(\mathtt{I}_{\mathtt{wR}}))) \ - \ (\operatorname{imag}(\mathtt{I}_{\mathtt{zz}}) * \operatorname{imag}(\mathtt{m}) \ - \ \operatorname{imag}(\mathtt{I}_{\mathtt{wR}})) + \ \operatorname{real}(\mathtt{I}_{\mathtt{wR}}) + \ \operatorname{real}(\mathtt{I}_{\mathtt{wR}})) + \ \operatorname{real}(\mathtt{I}_{\mathtt{wR}}) + 
real(I_zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - (imag(I_zz)*imag(m_wL) -
real(Izz)*real(mwL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - (imag(Izz)*imag(mwR)
- real(I zz) * real(m wR)) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2) + ((imag(d)^2 - real(m wR)) * (imag(m wR)) * 
real(d)^2 (imag(m)^2 - real(m)^2 - real(m)^2 - real(d)^4 imag(m) real(m) (imag(r)^4 + real(r)^4
-6*imag(r)^2*real(r)^2) + (imag(I_wL)*imag(I_zz) - real(I_wL)*real(I_zz))*(imag(r)^2 - real(I_wL)*real(I_zz))*(imag(r)^2 - real(I_wL)*real(I_zz))*(imag(r)^2 - real(I_wL)*real(I_zz))*(imag(r)^2 - real(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(imag(I_wL)*real(I_zz))*(i
real(r)^2 + (imag(I wR)*imag(I zz) - real(I wR)*real(I zz))*(imag(r)^2 - real(r)^2) +
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) -
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) -
(real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m))
+ imag(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real (m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) - real(L)*real(m) + real(m) + r
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) + imag(L)*((imag(m wR)*(imag(r)^4 + real(L)*imag(m))))
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)*real(r)^3 + 6*imag(r)^3 + 6*imag(r)*real(r)^3 + 6*imag(r)^3 + 6*imag(r)^3
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m_wR)*(imag(r)^4 + real(r)^4 - real(m)^4) + real(m)^4 - real(m)^4 + real(m)^4 - real(m)^4 + real(m)^4 - real(m)^4 + real(m)^4 + real(m)^4 - real(m)^4 + real(m)^4 + real(m)^4 + real(m)^4 - real(m)^4 + rea
6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
+ \ \text{real} \ (\texttt{L}) \ ^* \text{imag} \ (\texttt{m}) \ ) \ - \ (\text{imag} \ (\texttt{I} \_ \texttt{zz}) \ ^* \text{real} \ (\texttt{m}) \ + \ \text{real} \ (\texttt{I} \_ \texttt{zz}) \ ^* \text{imag} \ (\texttt{m}) \ ) \ ^* \ (4 \ ^* \text{imag} \ (\texttt{r}) \ ^* \text{real} \ (\texttt{r}) \ ^3 \ - \ ^* \text{real} \ (\texttt{m}) \ ) \ ^* \ (4 \ ^* \text{imag} \ (\texttt{r}) \ ^* \text{real} \ (\texttt{r}) \ ^3 \ - \ ^* \ )
4*imag(r)^3*real(r)) - (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(4*imag(r)*real(r)^3
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-4*imag(r)^3*real(r)) - (imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) - 2*imag(r)*real(r)*(imag(I wL))*real(I zz) + imag(I zz)*real(I wL))
- 2*imag(r)*real(r)*(imag(I_wR)*real(I_zz) + imag(I_zz)*real(I_wR))) \sim= 0
4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3 - 6*imag(r)^4*real(r)^4 + real(r)^4 + re
4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
-2*imag(r)*real(m)*real(r))*(real(I wL)*(imag(d)^2 - real(d)^2) + 2*imag(I wL)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*(imag(d)^2)
- real(d)^2) - 2*real(I wL)*imag(d)*real(d)) + (imag(m)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m)*real(r))*(real(I wR)*(imag(d)^2 - real(d)^2) + 2*imag(I wR)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2)
- real(d)^2 - 2 real(I wR) real(d) + ((imag(d)^2 - real(d)^2) (imag(m)^2 - real(d)^2)
real(m)^2 - 4*imag(d)*real(d)*imag(m)*real(m))*(<math>4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)
+ (imag(I zz)*real(m) + real(I zz)*imag(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
(imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+ (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+\ 4*abs(L)^2*(imag(I_wL)*real(I_wR) + imag(I_wR)*real(I_wL)) + imag(L)*((imag(m_wL))*(imag(r)^4) + imag(L)^4*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL))*(imag(m_wL
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(r)^4 - 6*imag(r)^3 + real(r)^4 - 6*imag(r)^2*real(r)^3 + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^4 + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)*real(r)^4 + real(m wL)*(4*imag(r)*real(r)^4 + real(m wL)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)
4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m_wL)*(imag(r)^4 + real(r)^4 - real(r)^4)) + (real(m_wL)*(imag(r)^4 + real(r)^4))
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m)
- \text{ real}(L) * \text{real}(m))) + \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + \text{real}(r)^4 - 6* imag(r)^2* \text{real}(r)^2) +
real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) +
(real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m))) == real(L)*((imag(m_wL)*(imag(r)^4)))
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m_wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 - 6*imag(r)^4 - 6
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ \text{ real}(L) * \text{imag}(m))) + \text{ real}(L) * ((imag(m wR) * (imag(r)^4 + \text{ real}(r)^4 - 6* imag(r)^2* real(r)^2))
+ real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(r)*imag(m) + 4*imag(m) + 4*imag(
real(L)*real(m)) - (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
real(L)*imag(m))) + 4*real(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 6*imag(r)^2*real(r)^2) + 6*imag(r)^2*real(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
          (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r)))*(imag(L)*real(m_wL) + real(L)*imag(m_wL))) + imag(L)*((imag(m)*(imag(r)^2)))
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
          (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
 - \text{ real}(I \text{ wL}) * \text{real}(L))) + \text{imag}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L)
- real(I wR)*real(L))) + 4*imag(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) + imag(L)*real(I_wR)) + imag(L)*real(I_wR) + imag(L)*real(I_w
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR) * real(L))) + 4*imag(L) * ((imag(m wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r)
2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) + imag(L)*real(I_wL)) + imag(L)*real(I_wL)) + imag(L)*real(I_wL) + imag(I_wL) + imag(I_w
(real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L))
2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - \\
(imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*imag(L))
- real(I wR) * real(L))) + 4 * real(L) * ((real(m wR) * (imag(r)^2 - real(r)^2) + (imag(r)^2 - real(r)^2)) + (imag(r)^2 - real(r)^2) + (imag(r)^2 
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) - (imag(m_wR)*(imag(r)^2 + imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_w
- real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) +
(2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4
+ \; real(r)^4 \; - \; 6*imag(r)^2*real(r)^2) \; + \; (imag(I_wL)*real(I_zz) \; + \; imag(I_zz)*real(I_wL))*(imag(r)^2 \; + \; imag(I_wL))*(imag(r)^2 \; + \; imag(r)^2 \;
- real(r)^2) + (imag(I_wR)*real(I_zz) + imag(I_zz)*real(I_wR))*(imag(r)^2 - real(r)^2) +
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m_wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r)))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) + 2*imag(d)*real(d)*imag(m)) + 2*imag(d)*real(d)*imag(m)) + 2*imag(d)*real(d)*imag(m) + 2*imag(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
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-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) +
 (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))
+ (imag(I zz)*imag(m wR) - real(I zz)*real(m wR))*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r) + 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz))
+ 2*imag(r)*real(r)*(imag(I wR)*imag(I zz) - real(I wR)*real(I zz)) &
4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
- (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
- 2*imag(r)*real(m)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
+ (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*(imag(d)^2 - real(r)^2)
real(d)^2 - 2real(I wR)^imag(d)^real(d) + real(L)^i(imag(m wL)^i(imag(r)^4 + real(r)^4 - real(d)^2) + real(d)^2 - 2real(d)^4 + real(d)^4 - real(d)^4
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ real(L)*imag(m)) + (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
real(L)*real(m))) + real(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2))
+ real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m) + real(m)*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m)
real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) - 
real(L)*real(m))) + 4*real(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 6*imag(r)^2*real(r)^4) + 6*imag(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real(r)^4*real
 real (m_wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(L)*real(m_wL) + real(L)*imag(m_wL)) 
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
- 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2
- real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- real(I_wL)*real(L))) + imag(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wR)*imag(L))
- real(I wR) * real(L))) + 4*imag(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*imag(L))
- real(I_wR)*real(L))) + 4*imag(L)*((real(m_wR)*(imag(r)^2 - real(r)^2) +
2*imag(m WR)*imag(r)*real(r))*(imag(I WL)*real(L) + imag(L)*real(I WL)) - (imag(m WR)*(imag(r)^2
 - real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) +
 (imag(I zz)*imag(m) - real(I zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 (imag(I_zz)*imag(m_wL) - real(I_zz)*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+ (imag(I zz)*imag(m wR) - real(I zz)*real(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+ (real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
4*abs(L)^2*(imag(I wL)*imag(I wR)) - real(I wL)*real(I wR)) + imag(L)*((imag(m wL)*(imag(r)^4 wL)) + imag(L)*(imag(m wL))*(imag(m wL)
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(m)^4 - 6*imag(r)^4 + real(m)^4 - 6*imag(m)^4 - 6*i
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
+ \text{ real}(L) * \text{imag}(m))) + \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2))
+ real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) + 4*imag(m) +
real(L)*real(m)) - (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
\texttt{real}(\texttt{L}) * \texttt{imag}(\texttt{m}))) + (\texttt{imag}(\texttt{I}\_\texttt{zz}) * \texttt{real}(\texttt{m}) + \texttt{real}(\texttt{I}\_\texttt{zz}) * \texttt{imag}(\texttt{m})) * (4* \texttt{imag}(\texttt{r}) * \texttt{real}(\texttt{r}) ^ 3 - \texttt{real}(\texttt{m}) + \texttt{re
4*imag(r)^3*real(r)) + (imag(I_zz)*real(m_wL) + real(I_zz)*imag(m_wL))*(4*imag(r)*real(r)^3
- 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I_wL)*real(I_zz) + imag(I_zz)*real(I_wL))
+ 2*imag(r)*real(r)*(imag(I wR)*real(I zz) + imag(I zz)*real(I wR)) ==
 (\text{real}\,(\text{m})\,\,^*\,(\text{imag}\,(\text{r})\,\,^2\,\,-\,\,\text{real}\,(\text{r})\,\,^2)\,\,+\,\,2\,^*\,\text{imag}\,(\text{m})\,\,^*\,\text{imag}\,(\text{r})\,\,^*\,\text{real}\,(\text{r})\,)\,\,^*\,(\text{real}\,(\text{I}\_\text{wL})\,\,^*\,(\text{imag}\,(\text{d})\,\,^2)\,\,^2) 
- real(d)^2 + 2*imag(I wL)*imag(d)*real(d) + (real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(real(I_wR)*(imag(d)^2 - real(d)^2) + 2*imag(I_wR)*imag(d)*real(d))
+ (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(m)^2 - real(m)^2) + 2*imag(m)*(imag(m)^2 - re
real(d)^2)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) + real(L)*((imag(m)*(imag(r)^2))*(4*imag(r)*(imag(m)*(imag(r))^2))*(4*imag(r)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL))
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+ \; (\text{real}\,(\text{m})\, *\, (\text{imag}\,(\text{r})\, ^2 \, - \, \text{real}\,(\text{r})\, ^2) \; + \; 2\, *\, \text{imag}\,(\text{m})\, *\, \text{imag}\,(\text{r})\, *\, \text{real}\,(\text{r})\, )\, *\, (\text{imag}\,(\text{I}_{\text{wL}})\, *\, \text{imag}\,(\text{L})\, )) \; + \; 2\, *\, \text{imag}\,(\text{m})\, *\, 
   - real(I wL)*real(L))) + real(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
   2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
   (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
   - real(I wR)*real(L))) + 4*real(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
  2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
   (real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L)
   - \text{real}(I \text{ wR}) \text{*real}(L))) + 4 \text{*real}(L) \text{*}((imag(m \text{ wR}) \text{*}(imag(r) ^2 - real(r) ^2) -
  2*imag(r)*real(m wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) + (real(m_wR)*(imag(r)^2 + imag(L))*real(I_wL)) + (real(m_wR))*(imag(I_wL)*real(I_wL)) + (real(m_wR))*(imag(I_wL)*real(I_wL)) + (real(m_wR))*(imag(I_wL)*real(I_wL)) + (real(m_wR))*(imag(I_wL)*real(I_wL)) + (real(m_wR))*(imag(I_wL)*real(I_wL)) + (real(m_wR))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(imag(I_wL))*(
   - \operatorname{real}(r)^2) + 2^{\operatorname{w}} \operatorname{imag}(m \ wR) \operatorname{imag}(r) \operatorname{real}(r)) \operatorname{imag}(I_wL) \operatorname{imag}(L) - \operatorname{real}(I_wL) \operatorname{real}(L))) + 2^{\operatorname{w}} \operatorname{imag}(m \ wR) \operatorname{real}(L) \operatorname{real}(L) + 2^{\operatorname{w}} \operatorname{imag}(m \ wR) \operatorname{real}(L) + 2^{\operatorname{w}} \operatorname{real}(L) \operatorname{real}(L) + 2^{\operatorname{w}} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L)} + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L)} + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{real}(L)} + 2^{\operatorname{w} \operatorname{real}(L) + 2^{\operatorname{w} \operatorname{
   ((imag(d)^2 - real(d)^2)*(imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))*(imag(r)^4)
   + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I wL)*imag(I zz) - real(I wL)*real(I zz))*(imag(r)^2
   - real(r)^2 + (imag(I wR)*imag(I zz) - real(I wR)*real(I zz))*(imag(r)^2 - real(r)^2) +
   (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
   -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
   (imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^2)
   4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m));
(real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
   real (m \ wL) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*imag(m) -
   real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
   imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)))
  - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I wL)*(imag(d)^2)
   - \text{ real}(d)^2 + 2 \text{ imag}(I \text{ wL}) \text{ imag}(d) \text{ real}(d) - (\text{real}(m) \text{ imag}(r)^2 - \text{real}(r)^2) +
  2*imag(m)*imag(r)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I_wL)*imag(d)*real(d))
  - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I_wR)*(imag(d)^2)
  - real(d)^2) + 2*imag(I_wR)*imag(d)*real(d)) - (real(m)*(imag(r)^2 - real(r)^2) + (real(m)^2) - real(m)^2) + (real(m)^2) + (re
  2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
   -4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
   real (m \ wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*real(m \ wL) +
   real(L)*imag(m wL)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
   -imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - 4*imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - 4*imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)*real(r)))*(imag(L)*imag(m wL) - 4*imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)*real(r)))*(imag(L)*imag(m wL) - 4*imag(m wL) - 4*im
   real(L)*real(m wL))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(m wR))
   real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) - real(L)*real(m) - real(L)*real(m)) - real(L)*real(m) - real(
   (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
   -4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) - ((imag(d)^2 - imag(m))) - (imag(d)^2 - imag(m)))
   real(d)^2 (imag(m)^2 - real(m)^2 - 4*imag(d)*real(d)*imag(m)*real(m))*(4*imag(r)*real(r)^3 - (4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*
   4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*imag(r)^2*real(r)^2
   real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))
             (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
   -4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + imag(L)*((imag(m)*(imag(r)^2))
   - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
   + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
   - \text{real}(I \text{ wL}) * \text{real}(L))) + \text{imag}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) - \text{real}(r)^2)
   2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
   (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
   - real(I wR)*real(L))) + 4*imag(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
   2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
   (real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
   - \text{ real}(I \text{ wR}) \text{ *real}(L))) + 4 \text{ *imag}(L) \text{ *}((imag(m \text{ wR}) \text{ *}(imag(r)^2 - real(r)^2) -
   2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) +
   (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L))
   - \text{ real}(I \text{ wL}) * \text{real}(L))) + \text{ real}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
  2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) -
   (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
   - real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
  2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
   (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L))
   - real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
  2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
   (imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
   - real(I wR)*real(L))) + 4*real(L)*((real(m wR)*(imag(r)^2 - real(r)^2) +
   2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) - (imag(m_wR)*(imag(r)^2 + imag(m_wR))*(imag(r)^2 + imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR
   (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - 6*imag(r)^2*real(r)^2
    (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 - 6*im
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(imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*real(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(ima
  (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4
 + \ \text{real}(\texttt{r}) \, ^4 - 6 \, \text{*imag}(\texttt{r}) \, ^2 \, \text{*real}(\texttt{r}) \, ^2) \ + \ (\text{imag}(\texttt{I}\_\texttt{wL}) \, \text{*real}(\texttt{I}\_\texttt{zz}) \ + \ \text{imag}(\texttt{I}\_\texttt{zz}) \, \text{*real}(\texttt{I}\_\texttt{wL})) \, \text{*} \, (\text{imag}(\texttt{r}) \, ^2) \, \text{*real}(\texttt{I}\_\texttt{vL}) \, \text{*real}(\texttt{vL}) \, \text{*real}(\texttt
 - real(r)^2 + (imag(I wR)*real(I zz) + imag(I zz)*real(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(I wR))*(imag(
 (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
 (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
 (imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 4*imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 4*imag(d)*real(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*(imag(d)^2 - real(d)^2) - 2*imag(d)*(imag(d)^2) - 2*imag(d)*(imag(d)^2)
4*abs(L)^2*(imag(I wL)*real(I wR) + imag(I wR)*real(I wL)) - imag(L)*((imag(m wL)*(imag(r)^4 wL)) - imag(L)*(imag(m wL))*(imag(m wL))
 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(r)^4 - 6*imag(r)^2*real(r)^3 + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^4 + real(m wL)^4 + 
 4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
 6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*imag(m)
 - \text{ real}(L) \text{ *real}(m))) - \text{imag}(L) \text{ *}(\text{imag}(m \text{ wR}) \text{ *}(\text{imag}(r)^4 + \text{real}(r)^4 - 6\text{*imag}(r)^2\text{*real}(r)^2)
 + real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + 4*imag(r)^3*real(m)))*(imag(L)*real(m) + 4*imag(m)^3*real(m)))*(imag(L)*real(m) + 4*imag(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)
 real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m_wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(r)*imag(m) - 4*imag(m) - 4*imag(m
 \label{eq:real_state} \texttt{real(L)*real(m)))} + (\texttt{imag(I\_zz)*imag(m)} - \texttt{real(I\_zz)*real(m))*(4*imag(r)*real(r)^3} - \texttt{real(L)*real(m))} + (\texttt{imag(I\_zz)*imag(m)} - \texttt{real(I\_zz)*real(m))} + (\texttt{imag(I)*imag(m)} - \texttt{real(I\_zz)*real(m))} + (\texttt{imag(I\_zz)*imag(m)} - \texttt{real(I\_zz)*imag(m)} + (\texttt{imag(I\_zz)*imag(m)} - \texttt{imag(I\_zz)*imag(m)} + (\texttt{imag(I\_zz)*imag(m)} + \texttt{imag(I\_zz
 4*imag(r)^3*real(r)) + (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r) + (imag(Izz)*imag(mwR) - real(Izz)*real(mwR))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz))
 + 2*imag(r)*real(r)*(imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz)))*((imag(m)*(imag(r)^2
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(real(I_wL)*(imag(d)^2 - real(d)^2)
 + 2*imag(I wL)*imag(d)*real(d)) - 4*imag(L)*((imag(m wR)*(imag(r)^4 + 2*imag(L))*(imag(m wR))*(imag(m wR))*
 real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)*real(r)^3 - 6*imag(r)^3 - 6*imag(r)*real(r)^3 - 6*imag(r)^3 - 6*imag(r)*real(r)^3 - 6*imag(r)^3 -
 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL)) + (real(m wR)*(imag(r)^4
 + real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(m wR)*(4*imag(r)*real(r)^3 - imag(m wR)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(4*imag(r)*real(r)*(
 4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + (real(m)*(imag(r)^2 - real(r)^2)
 + 2*imag(m)*imag(r)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
 + (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I wR)*(imag(d)^2)
 - real(d)^2 + 2*imag(I wR)*imag(d)*real(d) + (real(m)*(imag(r)^2 - real(r)^2) + (real(m)*(imag(r)^2 - real(r)^2) + (real(m)*(imag(r)^2 - real(r)^2) + (real(m)*(imag(r)^2) + (real(m)
 2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
 + real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) 
 real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
 real(L)*imag(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) - real(M)*real(m)) - real(M)*real(m)) - real(M)*real(m)) - real(M)*real(M)) - real(M)*real
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) + ((imag(d)^2 - imag(m))) + (imag(d)^2 - imag(m)))
 real(d)^2 (imag(m)^2 - real(m)^2 - rea
 4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))
 - (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + imag(L)*((imag(m)*(imag(r)^2))
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
 + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
 - \text{real}(I \text{ wL}) * \text{real}(L))) + \text{imag}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) - \text{real}(r)^2)
 2*imag(r)*real(m)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
 - real(I wR) * real(L))) + 4*imag(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) + imag(L)*real(I_wR)) + imag(L)*real(I_wR) + imag(L)*real(I_w
  (\text{real}(\text{m\_wL})*(\text{imag}(\text{r})^2 - \text{real}(\text{r})^2) + 2*\text{imag}(\text{m\_wL})*\text{imag}(\text{r})*\text{real}(\text{r}))*(\text{imag}(\text{I\_wR})*\text{imag}(\text{L}) 
 - real(I wR) * real(L))) + 4*imag(L) * ((imag(m wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r)
2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) + imag(L)*real(I_wL)) + imag(L)*real(I_wL) + imag(I_wL) + imag(I_wL
  (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L) - real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*(imag(r))*(imag(r))*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag
 \label{eq:control_control_control_control} real(I_wL)*real(L)) - 4*imag(L)*(imag(L)*(imag(I_wL))*real(I_wR) + imag(I_wR)*real(I_wL))
 + \ real(L) * (imag(I_wL) * imag(I_wR) - real(I_wL) * real(I_wR))) + real(L) * ((real(m) * (imag(r) ^2 + real(L) * (imag(r) 
 - \ \text{real}(\texttt{r}) \,^2) \,\, + \,\, 2 \,^* \text{imag}(\texttt{m}) \,^* \text{imag}(\texttt{r}) \,^* \text{real}(\texttt{r})) \,^* \,^* (\text{imag}(\texttt{I}_\texttt{wL}) \,^* \text{real}(\texttt{L}) \,\, + \,\, \text{imag}(\texttt{L}) \,^* \text{real}(\texttt{I}_\texttt{wL}))
 - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
 - real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
 2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
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(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wR)*imag(L))
- real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I wR)) -
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
2*imag(m wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) - (imag(m_wR)*(imag(r)^2 + imag(m_wR)) + imag(m_wR)*(imag(m_wR)) + imag(m_wR)*(imag(m_wR)) + imag(m_wR)*(imag(m_wR)) + imag(m_wR)*(imag(m_wR)) + imag(m_wR)*(imag(m_wR)) + imag(m_wR) + imag(m_
- \text{real}(r)^2 - 2 \times \text{imag}(r) \times \text{real}(m \text{ wR}) \times \text{real}(r) \times (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{real}(I \text{ wL}) \times \text{real}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{real}(I \text{ wL}) \times \text{real}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{real}(I \text{ wL}) \times \text{real}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{real}(I \text{ wL}) \times \text{real}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{real}(I \text{ wL}) \times \text{real}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL}) \times \text{imag}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL}) \times \text{imag}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL}) \times \text{imag}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL}) \times \text{imag}(L)) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag}(L) - \text{imag}(I \text{ wL})) + (\text{imag}(I \text{ wL}) \times \text{imag
4*real(L)*(imag(L)*(imag(I wL)*imag(I wR)) - real(I wL)*real(I wR)) - real(L)*(imag(I wL)*real(I wR))
+ imag(I wR)*real(I wL))) + (imag(I zz)*real(m) + real(I zz)*imag(m))*(imag(r)^4 + real(r)^4
-6*imag(r)^2*real(r)^2 + (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(imag(r)^4 + real(I zz)*imag(m wL)*(imag(r)^4 + real(I zz)*imag(r)*(imag(r)^4 + real(I zz)*(im
 real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*real(m_wR) + real(I_zz)*imag(m_wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 + real(r)
+ real(r)^4 - 6*imag(r)^2*real(r)^2 - (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + (2*imag(d)*real(m)^2) +
2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
- (imag(I wL)*real(I zz) + imag(I zz)*real(I wL))*(imag(r)^2 - real(r)^2)
              (imag(I WR) * real(I ZZ) + imag(I ZZ) * real(I WR)) * (imag(r)^2 - real(r)^2) -
 (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) -
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) -
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) -
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m))
-imag(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m
(real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) - imag(L)*((imag(m wR)*(imag(r)^4 - real(m)))) - imag(L)*(imag(m wR)*(imag(r)^4 - real(m))))
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)*real(r)^3 + 6*imag(r)^3 + 6*imag(r)*real(r)^3 + 6*imag(r)^3 + 6*imag(r)^3
4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - real(m))*(imag(r)^4 + real(m)^4 - real(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag
6*imag(r)^2*real(r)^2 - imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m)
- real(L)*real(m))) - (imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r)) - (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3
- 4*imag(r)^3*real(r)) - (imag(I_zz)*imag(m_wR) - real(I_zz)*real(m_wR))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) - 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz)
-2*imag(r)*real(r)*(imag(I wR)*imag(I zz) - real(I wR)*real(I zz))) +
 (4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
- (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r)*real(r)^3 - 6*imag(r)^4 + real(r)^4 - 6*imag(r)^4 - 6*imag(r
4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
-2*imag(r)*real(m)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I_wL)*imag(d)*real(d))
              (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wL)*(imag(d)^2)
- real(d)^2) + 2*imag(I_wL)*imag(d)*real(d)) + (imag(m)*(imag(r)^2 - real(r)^2) - real(r)^2
2*imag(r)*real(m)*real(r))*(imag(I_wR)*(imag(d)^2 - real(d)^2) - 2*real(I_wR)*imag(d)*real(d))
- (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I wR)*(imag(d)^2 - real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(
real(d)^2 + 2*imag(I wR)*imag(d)*real(d) + real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - real(d)^2))
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ \text{ real}(L) * imag(m)) + (\text{real}(m wL) * (imag(r)^4 + \text{real}(r)^4 - 6* imag(r)^2* real(r)^2)
-imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) -
real(L)*real(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m)^4 + real(m)^4
real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m)) + real(L)*imag(m) + real(L)*imag(m)) + real(L)*imag(m))
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) - (2*imag(d)*real(d)*(imag(m)^2)
- \text{ real (m) }^2 + 2 \times \text{imag (m) } \times \text{real (m) } \times \text{(imag (d) }^2 - \text{ real (d) }^2) \times (4 \times \text{imag (r) } \times \text{real (r) }^3 - \text{real (m) }^2
4*imag(r)^3*real(r)) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^4 + real(r)^4 + re
 real (m_wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(L)*real(m_wL) + real(L)*imag(m_wL)) 
+ (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2))*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(i
- real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) + imag(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - imag(L)*real(I_wR)
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
- real(I_wR) * real(L))) + 4*imag(L) * ((real(m_wL) * (imag(r)^2 - real(r)^2) + (imag(r)^2 - real(r)^2)) + (imag(r)^2 - real(r)^2) + (imag(r)^2 - 
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
 (imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*imag(L))
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- real(I_wR) * real(L))) + 4*imag(L)*((real(m_wR)*(imag(r)^2 - real(r)^2) + 4*imag(L)*((real(m_wR)*(imag(r)^2 - real(r)^2)))))
 2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
 (imag(m_wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*imag(L))*(imag(m_wR)*real(r))*(imag(r)^2 - real(r)^2)*(imag(r)^2 - real(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(i
 - real(I wL)*real(L))) - real(L)*((imag(m)*(imag(r)^2 - real(r)^2) - real(L)))
2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L))
 - \text{real}(I \text{ wL}) * \text{real}(L))) - \text{real}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L)
 - real(I wR) * real(L))) - 4 * real(L) * ((imag(m wL) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(
2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
 (real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
 - real(I wR)*real(L))) - 4*real(L)*((imag(m wR)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) + (real(m wR)*(imag(r)^2 + imag(r)*real(I wL)) + (real(m wR)*(imag(r)^2 + imag(r)*real(I wL)) + (real(m wR)*(imag(r)*real(L) + imag(L) + imag(
 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) +
  (imag(I zz)*imag(m) - real(I zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
  (imag(I_zz)*imag(m_wL) - real(I_zz)*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*imag(m_wL) - real(I_zz)*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*imag(m_wL) - real(I_zz)*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(I_zz)*imag(m_wL) - real(I_zz)*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^4 - 6*im
  (imag(I zz)*imag(m wR) - real(I zz)*real(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 ((imag(d)^2 - real(d)^2)*(imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))*(imag(r)^4)
 + \ \operatorname{real}(r)^4 - 6*\operatorname{imag}(r)^2*\operatorname{real}(r)^2) - (\operatorname{imag}(I_wL)*\operatorname{imag}(I_zz) - \operatorname{real}(I_wL)*\operatorname{real}(I_zz))*(\operatorname{imag}(r)^2)
 - \ \text{real}(\texttt{r}) \, ^2) \, - \, (\texttt{imag}(\texttt{I}\_\texttt{wR}) \, ^*\texttt{imag}(\texttt{I}\_\texttt{zz}) \, - \, \texttt{real}(\texttt{I}\_\texttt{wR}) \, ^*\texttt{real}(\texttt{I}\_\texttt{zz})) \, ^*(\texttt{imag}(\texttt{r}) \, ^2 \, - \, \texttt{real}(\texttt{r}) \, ^2) \, - \, ^*\texttt{real}(\texttt{r}) \, - \, ^*\texttt{real}(\texttt{real}(\texttt{r}) \, - \, ^*\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(\texttt{real}(
 (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
 (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r)))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) - real(d)^2 - r
 (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m_wR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
4*abs(L)^2*(imag(I wL)*imag(I wR)) - real(I wL)*real(I wR)) + imag(L)*((imag(m wL)*(imag(r)^4 WL)))
 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 -
 4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m))*(imag(m)^4 + real(m)^4 + rea
 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
 + \text{ real}(L) * imag(m))) + imag(L) * ((imag(m wR) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2)
 + real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
 \label{eq:real_loss} \texttt{real(L)*real(m))} \ - \ (\texttt{real(m\_wR)*(imag(r)^4} \ + \ \texttt{real(r)^4} \ - \ \texttt{6*imag(r)^2*real(r)^2})
 -imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + (imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(
 real(L)*imag(m))) + (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(4*imag(r)*real(r)^3 - Imag(m))*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*(1.5)*
 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + (imag(Izz)*real(mwR) + real(Izz)*imag(mwR))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I_wL)*real(I_zz) +
 imag(I_zz)*real(I_wL)) + 2*imag(r)*real(r)*(imag(I_wR)*real(I_zz) +
 imag(I_zz)*real(I_wR)))*(4*imag(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4) + (imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^4) + (imag(m_wR)*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m
  real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
 - (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3 - imag(m WR)*(4*imag(r))^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r))^4 - 6*imag(r)^4 - 6*i
4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) - (imag(m)*(imag(r)^2 - real(r)^2)
 -2*imag(r)*real(m)*real(r))*(imag(I wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
 + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wL)*(imag(d)^2)
 - real(d)^2 + 2*imag(I wL)*imag(d)*real(d) - (imag(m)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m)*real(r))*(imag(I wR)*(imag(d)^2 - real(d)^2) - 2*real(I wR)*imag(d)*real(d))
 + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I wR)*(imag(d)^2 -
 real(d)^2 + 2*imag(I wR)*imag(d)*real(d) + real(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - real(d)^2))
 6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
 + \text{ real}(L) * \text{imag}(m)) + (\text{real}(m \text{ wL}) * (\text{imag}(r)^4 + \text{real}(r)^4 - 6* \text{imag}(r)^2* \text{real}(r)^2)
 - imag(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(r)*imag(m) - 4*imag(m) - 
 real(L)*real(m))) + real(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m)^4 + real(m)^4
 real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + real(L)*imag
  (\text{real}(\text{m\_wR}) * (\text{imag}(\text{r}) ^4 + \text{real}(\text{r}) ^4 - 6* \text{imag}(\text{r}) ^2* \text{real}(\text{r}) ^2) - \text{imag}(\text{m\_wR}) * (4* \text{imag}(\text{r}) * \text{real}(\text{r}) ^3) 
 -4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) + (2*imag(d)*real(d)*(imag(m)^2)
 - \text{ real (m) }^2 + 2 \times \text{imag (m) } \times \text{real (m) } \times \text{(imag (d) }^2 - \text{ real (d) }^2) \times (4 \times \text{imag (r) } \times \text{real (r) }^3 - \text{real (m) }^2
 4*imag(r)^3*real(r) + 4*real(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^4*real(r)^4 + 4*real(r)^4 + 
  real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL)) 
 + (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2))*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(i
 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL))
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- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wL)*imag(L))
- real(I wL)*real(L))) + imag(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) -
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L)
- \text{real}(I \text{ wR}) * \text{real}(L))) + 4* \text{imag}(L) * ((\text{real}(m \text{ wR}) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
(imag(m WR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_WR)*real(r))*(imag(I_WL)*imag(L) - 2*imag(r)*real(m_WR)*real(r))*(imag(r)^2 - real(r)^2)
real(I_wL)*real(L))) + 4*imag(L)*(imag(L)*(imag(I_wL)*imag(I_wR) - real(I_wL)*real(I_wR))
- \text{real}(L) * (imag(I wL) * real(I wR) + imag(I wR) * real(I wL))) - real(L) * ((imag(m) * (imag(r) ^2 wR) * real(L) * (imag(m) *
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wL)*imag(L)
- \text{real}(I \text{ wL}) * \text{real}(L))) - \text{real}(L) * ((imag(m) * (imag(r)^2 - \text{real}(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
- \text{real}(I \text{ wR}) \text{*real}(L))) - 4 \text{*real}(L) \text{*}((imag(m \text{ wL}) \text{*}(imag(r) ^2 - real(r) ^2) -
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) - 4*real(L)*((imag(m wR)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) +
(real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L) - real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*(imag(r))*(imag(r))*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag
real(I wL)*real(L))) + 4*real(L)*(imag(L)*(imag(I wL)*real(I wR) + imag(I wR)*real(I wL))
+ \ \operatorname{real}\left(\mathtt{L}\right) * \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{L}\right) * \operatorname{imag}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{R}\right) \ - \ \operatorname{real}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{L}\right) * \operatorname{real}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{R}\right)\right)\right) \ - \ \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\underline{\mathsf{z}}}}\mathtt{z}\right) * \operatorname{imag}\left(\mathtt{m}\right) \ - \ \operatorname{real}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{R}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\underline{\mathsf{w}}}}\mathtt{R}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right) + \operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right)\right)\right) + \left(\operatorname{imag}\left(\mathtt{I}_{\underline{\mathsf{w}}}\mathtt{R}\right)\right) + \left(\operatorname{
real(I_zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - (imag(I_zz)*imag(m_wL) -
real(Izz)*real(mwL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - (imag(Izz)*imag(mwR)
- \text{ real}(I zz) * \text{real}(m wR)) * (imag(r)^4 + \text{ real}(r)^4 - 6*imag(r)^2* \text{real}(r)^2) + ((imag(d)^2 - 6*imag(r)^4* + 6
real(d)^2 * (imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))* (imag(r)^4 + real(r)^4
-6*imag(r)^2*real(r)^2 + (imag(I wL)*imag(I zz) - real(I wL)*real(I zz))*(imag(r)^2 - real(I wL)*real(I zz))*(imag(r)^2 - real(I zz))*(imag(r)
real(r)^2 + (imag(I wR)*imag(I zz) - real(I wR)*real(I zz))*(imag(r)^2 - real(r)^2) +
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) - 2*imag(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m_wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) -
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m))
+ imag(L)*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) -
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) + imag(L)*((imag(m wR)*(imag(r)^4)))
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 - 6*imag(r)^4 - 6
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wR)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ real(L)*imag(m))) - (imag(I zz)*real(m) + real(I zz)*imag(m))*(4*imag(r)*real(r)^3 - real(L)*imag(m))) + (imag(I zz)*real(m) + real(I zz)*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))*(4*imag(m))
4*imag(r)^3*real(r)) - (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r) - (imag(Izz)*real(mwR) + real(Izz)*imag(mwR))*(4*imag(r)*real(r)^3
- 4*imag(r)^3*real(r)) - 2*imag(r)*real(r)*(imag(I wL))*real(I zz) + imag(I zz)*real(I wL))
-2*imag(r)*real(r)*(imag(I_wR)*real(I_zz) + imag(I_zz)*real(I_wR))) == 0
& (4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3 - imag(m WR)*(4*imag(r))^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r))*(4*imag(r))^4 - 6*imag(r)^4 - 6*imag(r)
4*imag(r)^3*real(r)))*(imag(L)*imag(m_wL) - real(L)*real(m_wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
- 2*imag(r)*real(m)*real(r))*(real(I_wL)*(imag(d)^2 - real(d)^2) + 2*imag(I_wL)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*(imag(d)^2)
- real(d)^2 - 2*real(I_wL)*imag(d)*real(d) + (imag(m)*(imag(r)^2 - real(r)^2) - (imag(m))*(imag(m))^2 - real(m)^2 - real(m)^
2*imag(r)*real(m)*real(r))*(real(I_wR)*(imag(d)^2 - real(d)^2) + 2*imag(I_wR)*imag(d)*real(d))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*(imag(d)^2)
- real(d)^2 - 2 real(I wR) rimag(d) real(d) + ((imag(d)^2 - real(d)^2) real(d)^2 - real(d)^2 + (imag(m)^2 - real(d)^2) real(d)^2 + (imag
real(m)^2 - 4*imag(d)*real(d)*imag(m)*real(m))*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))
+ (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
(imag(I_zz)*real(m_wL) + real(I_zz)*imag(m_wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+ (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
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+\ 4*abs(L)^2*(imag(I_wL)*real(I_wR) + imag(I_wR)*real(I_wL)) + imag(L)*((imag(m_wL)*(imag(r)^4L)) + imag(L)*(imag(m_wL))*(imag(m_wL))*(imag(m_wL)) + imag(m_wL)) + imag(m_wL) + imag(m_w
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(m)^4 - 6*imag(r)^4 - 6*imag(r)^4 + real(m)^4 - 6*imag(r)^4 - 6*imag(r)^4 + real(m)^4 - 6*imag(m)^4 - 6
4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m)^4)
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m)
- \text{ real}(L) * \text{real}(m))) + \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + \text{real}(r)^4 - 6* imag(r)^2* \text{real}(r)^2) +
real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) \sim = real(L)*(imag(m wL)*(imag(r)^4)*(imag(m) - real(L)*(imag(m) wL)*(imag(m) - real(L)*(imag(m) wL)*(imag(m) wL)*
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(r)^4 - 6*imag(r)^2*real(r)^3 + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^4 + real(m wL)*(4*imag(r)*real(r)^4 + real(m wL)^4 + real(m wL)^
4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m_wL)*(imag(r)^4 + real(r)^4 - real(m)))
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
+ \text{ real}(L) * \text{imag}(m))) + \text{ real}(L) * ((imag(m wR) * (imag(r)^4 + \text{ real}(r)^4 - 6* imag(r)^2* real(r)^2))
+ real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
real(L)*real(m)) - (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + 4*imag(r)^3*real(m)))*(imag(L)*real(m) + 4*imag(r)^3*real(m)))*(imag(L)*real(m) + 4*imag(r)^3*real(m)))*(imag(L)*real(m) + 4*imag(m)))*(imag(L)*real(m)))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(
real(L)*imag(m))) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real (m wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*imag(m wL) - real(L)*real(m wL))
- (real (m wR) * (imag(r) ^4 + real (r) ^4 - 6*imag(r) ^2*real (r) ^2 - imag(m wR) * (4*imag(r) *real (r) ^3
-4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + imag(L)*((imag(m)*(imag(r)^2))
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
+ \; (\text{real}\,(\text{m})\, *\, (\text{imag}\,(\text{r})\, ^2\, - \; \text{real}\,(\text{r})\, ^2) \; + \; 2 \, *\, \text{imag}\,(\text{m})\, *\, \text{imag}\,(\text{r})\, *\, \text{real}\,(\text{r})\, )\, *\, (\text{imag}\,(\text{I}\_\text{wL})\, *\, \text{imag}\,(\text{L})\, )) \; + \; (\text{Imag}\,(\text{I}\_\text{wL})\, *\, \text{Imag}\,(\text{I}\_\text{wL})\, *\, 
- real(I wL)*real(L))) + imag(L)*((imag(m)*(imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR) * real(L))) + 4* imag(L) * ((imag(m wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2) - real(r)^2 - real(
2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) +
(real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L))
- real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L)
- real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
 - \text{ real}(I \text{ wR}) * \text{real}(L))) + 4* \text{real}(L) * ((\text{real}(m \text{ wR}) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) - (imag(m_wR)*(imag(r)^2
(2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4
+ \; real(r)^4 \; - \; 6*imag(r)^2*real(r)^2) \; + \; (imag(I_wL)*real(I_zz) \; + \; imag(I_zz)*real(I_wL))*(imag(r)^2 \; + \; imag(I_wL))*(imag(r)^2 \; + \; imag(r)^2 \; + \; imag(r)
- real(r)^2) + (imag(I_wR)*real(I_zz) + imag(I_zz)*real(I_wR))*(imag(r)^2 - real(r)^2) +
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) +
(imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))
+ (imag(I_zz)*imag(m_wR) - real(I_zz)*real(m_wR))*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz))
+ 2*imag(r)*real(r)*(imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz)) |
4*imag(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
- (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
-2*imag(r)*real(m)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I_wL)*imag(d)*real(d))
+ (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*(imag(d)^2 - real(r)^2)
real(d)^2 - 2real(I wR)^imag(d)^real(d) + real(L)^i(imag(m wL)^i(imag(r)^4 + real(r)^4 - real(d)^2) + real(d)^2 - 2real(d)^4 + real(d)^4 - real(d)^4
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6*imag(r)^2*real(r)^2) + real(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
 + \text{ real}(L) * \text{imag}(m)) + (\text{real}(m \ wL) * (\text{imag}(r)^4 + \text{real}(r)^4 - 6* \text{imag}(r)^2* \text{real}(r)^2)
 -imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) - 4*imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag
 real(L)*real(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2))
 + real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m) + real(m)*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m))*(imag(L)*real(m)
 real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
 real(L)*real(m))) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) * (imag(L)*real(m wL) + real(L)*imag(m wL))
 + (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r)))*(imag(L)*imag(m_wL) - real(L)*real(m_wL))) + imag(L)*((real(m)*(imag(r)^2)))
 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
 - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
 - \text{real}(I \text{ wL}) * \text{real}(L))) + \text{imag}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
 2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wR)*imag(L) + imag(I_wR)*imag(L) + imag(I_wR)*imag(I_wR)*imag(L) + imag(I_wR)*imag(I_wR)*imag(L) + imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)*imag(I_wR)
 - \text{real}(I \text{ wR}) \text{*real}(L))) + 4 \text{*imag}(L) \text{*}((\text{real}(m \text{ wL}) \text{*}(\text{imag}(r)^2 - \text{real}(r)^2) +
  2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - \\
 (imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L)
 - real(I wR)*real(L))) + 4*imag(L)*((real(m wR)*(imag(r)^2 - real(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) - (imag(m_wR)*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(r)^2 - imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(i
 - \  \, real(r)^2) \ - \ 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*imag(L) \ - \ real(I_wL)*real(L))) \ + \  \, (I_wL)*real(L))) \ + \  \, (I_wL)*real(L))
 (imag(I zz)*imag(m) - real(I zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 + (imag(I_zz)*imag(m_wR) - real(I_zz)*real(m_wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 + (real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
 (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
4*abs(L)^2*(imag(I wL)*imag(I wR)) - real(I wL)*real(I wR)) + imag(L)*((imag(m wL)*(imag(r)^4 wL)))
 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 -
 4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(m)^4 - real(m))*(imag(m)^4 + real(m)^4 + rea
 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m)
 + \text{ real}(L) * \text{imag}(m))) + \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + \text{real}(r)^4 - 6* imag(r)^2* real(r)^2)
 + real(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) -
 \label{eq:real_model} \texttt{real(L)*real(m))} \ - \ (\texttt{real(m_wR)*(imag(r)^4} + \texttt{real(r)^4} - \texttt{6*imag(r)^2*real(r)^2})
 -imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
 real(L)*imag(m))) + (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(4*imag(r)*real(r)^3 - (imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))
 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + (imag(Izz)*real(mwR) + real(Izz)*imag(mwR))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I_wL)*real(I_zz) + imag(I_zz)*real(I_wL))
 + 2*imag(r)*real(r)*(imag(I wR)*real(I zz) + imag(I zz)*real(I wR)) \sim=
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wL)*(imag(d)^2)
 - real(d)^2 + 2*imag(I wL)*imag(d)*real(d) + (real(m)*(imag(r)^2 - real(r)^2) + (real(m)*(imag(r)^2) + (real(m)*
 2*imag(m)*imag(r)*real(r))*(real(I wR)*(imag(d)^2 - real(d)^2) + 2*imag(I wR)*imag(d)*real(d))
 + (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(m)^2)
 real(d)^2)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) + real(L)*((imag(m)*(imag(r)^2))
 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
 + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L)
 - real(I wL)*real(L))) + real(L)*((imag(m)*(imag(r)^2 - real(r)^2) - real(L)))
 2*imag(r) *real(m) *real(r)) *(imag(I wR) *real(L) + imag(L) *real(I wR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L)
 - real(I wR)*real(L))) + 4*real(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) + imag(L)*real(I_wR)) + imag(L)*real(I_wR) + imag(L)*real(I_w
  ({\tt real}\,({\tt m\_wL})\,*\,({\tt imag}\,({\tt r})\,^2\,-\,{\tt real}\,({\tt r})\,^2)\,\,+\,\,2\,*\,{\tt imag}\,({\tt m\_wL})\,*\,{\tt imag}\,({\tt r})\,*\,{\tt real}\,({\tt r})\,)\,*\,({\tt imag}\,({\tt I\_wR})\,*\,{\tt imag}\,({\tt L})\,
 - real(I_wR) * real(L))) + 4* real(L) * ((imag(m_wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r
2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) + (real(m wR)*(imag(r)^2 - imag(r))*real(m wR)*(imag(r))*real(m wR)*(imag(r))*real
 - \  \, real(r)^2) \ + \ 2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*imag(L) \ - \ real(I_wL)*real(L))) \ + \  \, real(I_wL)*real(L))
 ((imag(d)^2 - real(d)^2)*(imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))*(imag(r)^4)
 + \ \text{real}(\texttt{r}) \, ^4 - 6 \, \text{*imag}(\texttt{r}) \, ^2 \, \text{*real}(\texttt{r}) \, ^2) \ + \ (\text{imag}(\texttt{I}\_\texttt{wL}) \, \text{*imag}(\texttt{I}\_\texttt{zz}) - \, \text{real}(\texttt{I}\_\texttt{wL}) \, \text{*real}(\texttt{I}\_\texttt{zz})) \, \text{*} \, (\text{imag}(\texttt{r}) \, ^2) \, \text{*} \, (\text{im
 - real(r)^2) + (imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz))*(imag(r)^2 - real(I_wR)*real(I_zz))*
 real(r)^2 + (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(m wL)*(imag(m wL)*
 real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(m)*(imag(d)^2 - real(d)^2)
 -2*imag(d)*real(d)*real(m)) + (imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 + real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(m)*(imag(d)^2 - 4*imag(r)^3*real(r)))*(imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(im
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\label{eq:continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous_continuous
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*imag(m)
- \text{ real}(L) \text{ *real}(m)) - (\text{real}(m \ wL) \text{ *}(\text{imag}(r)^4 + \text{real}(r)^4 - 6 \text{*imag}(r)^2 \text{*real}(r)^2) -
imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I wL)*(imag(d)^2)
- real(d)^2 + 2*imag(I wL)*imag(d)*real(d) - (real(m)*(imag(r)^2 - real(r)^2) + (real(m)*(imag(r))^2 - real(r)^2)
2*imag(m)*imag(r)*real(r))*(imag(I wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(real(I wR)*(imag(d)^2
- \text{real}(d)^2 + 2 \text{imag}(I \text{ wR}) \text{imag}(d) \text{real}(d) - (\text{real}(m) \text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*(imag(d)^2 - real(d)^2) - 2*real(I_wR)*imag(d)*real(d))
-4*imag(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m WL) + (m WL)*(m WL)
real(L)*imag(m wL)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
-imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m_wL) - imag(m_wL)^3*(imag(m_wL)^3)
real(L)*real(m wL))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(L)*(imag(m wR))*(imag(m wR))
real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - real(L)*real(m)) - real(L)*real
 (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*real(m) + real(L)*imag(m))) - ((imag(d)^2 -
real(d)^2 * (imag(m)^2 - real(m)^2) - 4*imag(d)* real(d)* imag(m)* real(m) * (4*imag(r)* real(r)^3 - 1)* (4*imag(m)^2 - 1)* (
4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2
real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL))
- (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r))*(imag(L)*real(m wL) + real(L)*imag(m wL))) + imag(L)*((imag(m)*(imag(r)^2))
- real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL))
+ (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wL)*imag(L)
- real(I_wL) * real(L))) + imag(L) * ((imag(m) * (imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
(real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L)
- real(I wR)*real(L))) + 4*imag(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
- real(I wR) * real(L))) + 4*imag(L) * ((imag(m wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(r)
2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) + imag(L)*real(I_wL)) + imag(L)*real(I_wL)) + imag(L)*real(I_wL) + imag(L)*real(I_
(real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L))
- real(I wL)*real(L))) + real(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(L)
- \text{real}(I \text{ wL}) * \text{real}(L))) + \text{real}(L) * ((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*real(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(I_wR)*imag(L))
- real(I wR) * real(L))) + 4 * real(L) * ((real(m wR) * (imag(r)^2 - real(r)^2) + (imag(r)^2 - real(r)^2)) + (imag(r)^2 - real(r)^2) + (imag(r)^2 
2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) - (imag(m wR)*(imag(r)^2
- real(r)^2) - 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*imag(L) - real(I_wL)*real(L))) -
(imag(I zz)*real(m) + real(I zz)*imag(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 (2*imag(d)*real(d)*(imag(m)^2 - real(m)^2) + 2*imag(m)*real(m)*(imag(d)^2 - real(d)^2))*(imag(r)^4
+ \text{ real}(r)^4 - 6*\text{imag}(r)^2*\text{real}(r)^2) + (\text{imag}(I wL)*\text{real}(I zz) + \text{imag}(I zz)*\text{real}(I wL))*(\text{imag}(r)^2
- real(r)^2 + (imag(I wR)*real(I zz) + imag(I zz)*real(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(r)^2 - real(r)^2) + (imag(I wR))*(imag(I wR))*(imag(
(imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) +
(real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
(imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
(real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) -
4*abs(L)^2*(imag(I_wL)*real(I_wR) + imag(I_wR)*real(I_wL)) - imag(L)*((imag(m_wL)*(imag(r)^4L)) - imag(L)*((imag(m_wL)*(imag(m_wL))*(imag(m_wL))) - imag(L)*((imag(m_wL))*(imag(m_wL))) - imag(L)*((imag(m_wL))*(imag(m_wL))) - imag(L)*((imag(m_wL))*(imag(m_wL))) - imag(M_wL)*((imag(m_wL))*(imag(m_wL))) - imag(M_wL)*((imag(m_wL))) - imag(
+ real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 - 6*imag(r)^4 - 6
4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) + (real(m_wL)*(imag(r)^4 + real(r)^4 - real(m_wL)))*(imag(m)) + (real(m_wL))*(imag(m)) + (real(m_wL))*(imag(m))
6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m)
- \text{ real}(L) * \text{real}(m))) - \text{imag}(L) * ((imag(m wR) * (imag(r)^4 + \text{real}(r)^4 - 6* imag(r)^2* \text{real}(r)^2))
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+ real(m_wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + 4*imag(r)*real(m) + 4*imag(m) + 4*imag(
 real(L)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) - 4*imag(m))*(imag(m) - 4*imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(im
 real(L)*real(m))) + (imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(r)*real(r)^3 - real(L)*real(m)) + (imag(I zz)*imag(m) - real(I zz)*real(m))*(4*imag(I)*real(m)) + (imag(I zz)*imag(m) - real(I zz)*real(m)) + (imag(I zz)*real(m)) + (imag(I zz)*imag(m) - real(I zz)*real(m)) + (imag(I zz)*real(m)) + (imag(
 4*imag(r)^3*real(r)) + (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + (imag(Izz)*imag(mwR) - real(Izz)*real(mwR))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I wL)*imag(I zz) - real(I wL)*real(I zz))
 + 2*imag(r)*real(r)*(imag(I wR)*imag(I zz) - real(I wR)*real(I zz)))*((imag(m)*(imag(r)^3
 -3*imag(r)*real(r)^2 + real(m)*(real(r)^3 - 3*imag(r)^2*real(r)))*(imag(L)*imag(TaL)
 - \text{ real}(L) \text{ *real}(TaL)) + (imag(m) \text{ *}(real(r) \text{ }) - 3 \text{ *imag}(r) \text{ } 2 \text{ *real}(r)) - real(m) \text{ *}(imag(r) \text{ }) - 3 \text{ *imag}(r) \text{ } 3 \text{ } 3 \text{ *real}(r) \text{ } 3 \text{ } 3 \text{ *real}(r) \text{ } 3 \text{ } 3 \text{ } 3 \text{ *real}(r) \text{ } 3 \text{ }
 - 3*imag(r)*real(r)^2))*(imag(L)*real(TaL) + imag(TaL)*real(L)) - (imag(m)*(imag(r)^3 -
 3*imag(r)*real(r)^2 + real(m)*(real(r)^3 - 3*imag(r)^2*real(r))*(imag(L)*imag(TaR) -
 real(L)*real(TaR)) - (imag(m)*(real(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m)
 3*imag(r)*real(r)^2)*(imag(L)*real(TaR) + imag(TaR)*real(L)) + (imag(m wR)*(imag(r)^3 - mag(r))*(imag(r)^2)
 3*imag(r)*real(r)^2 + real(m_wR)*(real(r)^3 - 3*imag(r)^2*real(r)))*(2*imag(L)*imag(TaL)
 -2*real(L)*real(TaL)) + (imag(m wR)*(real(r)^3 - 3*imag(r)^2*real(r)) -
 real (m wR) * (imag(r) ^3 - ^3*imag(r) *real(r) ^2)) * (2*imag(L) *real(TaL) + 2*imag(TaL) *real(L))
 - (imag(m WL)*(imag(r)^3 - 3*imag(r)*real(r)^2) + real(m WL)*(real(r)^3 -
 3*imag(r)^2*real(r)))*(2*imag(L)*imag(TaR) - 2*real(L)*real(TaR)) - (imag(m wL)*(real(r)^3
 -3*imag(r)^2*real(r)) - real(m_wL)*(imag(r)^3 - 3*imag(r)*real(r)^2))*(2*imag(L)*real(TaR))
+ 2*imag(TaR)*real(L)) + (imag(theta_DOT)*(real(theta_DOT)*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^4 +
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 - imag(r)^4 - 6*imag(r)^2*real(r)^3 - imag(r)^4 - 6*imag(r)^4 - 6*i
 4*imag(r)^3*real(r))))*((imag(m)*real(m wL) + imag(m wL)*real(m))*(imag(L)*real(d)
 + \ \text{real} \ (\texttt{L}) \ \text{*imag} \ (\texttt{d})) \ - \ (\text{imag} \ (\texttt{m}) \ \text{*imag} \ (\texttt{m}\_\texttt{wL}) \ - \ \text{real} \ (\texttt{m}) \ \text{*real} \ (\texttt{m}\_\texttt{wL}) \ ) \ \text{*} \ (\text{imag} \ (\texttt{L}) \ \text{*imag} \ (\texttt{d})
 - real(L) * real(d))) + (imag(theta DOT) * (real(theta DOT) * (imag(r)^4 + Imag(theta DOT)) * (imag(theta DOT) * (imag(theta 
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 -
 4*imag(r)^3*real(r)) - real(theta DOT)*(real(theta DOT)*(4*imag(r)^*real(r)^3
 - 4*imag(r)^3*real(r) + imag(theta DOT)*(imag(r)^4 + real(r)^4 - 4*imag(r)^5
 6*imag(r)^2*real(r)^2)))*((imag(m)*real(m_wL) + imag(m_wL)*real(m))*(imag(L)*imag(d)))
 - real(L) * real(d)) + (imag(m) * imag(m wL) - real(m) * real(m wL)) * (imag(L) * real(d)
 + real(L)*imag(d))) - (imag(theta_DOT)*(real(theta_DOT)*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^4 +
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 -
 4*imag(r)^3*real(r))))*((imag(m)*real(m wR) + imag(m wR)*real(m))*(imag(L)*real(d)
 + real(L)*imag(d)) - (imag(m)*imag(m wR) - real(m)*real(m wR))*(imag(L)*imag(d)
 - real(L)*real(d))) - (imag(theta DOT)*(real(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))
 - real(theta DOT)*(real(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) +
 imag(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)))*((imag(m)*real(m wR))
 + imag(m_wR)*real(m))*(imag(L)*imag(d) - real(L)*real(d)) + (imag(m)*imag(m_wR) - real(d))*(imag(m)*imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(
 real(m)*real(m wR))*(imag(L)*real(d) + real(L)*imag(d))) + (imag(theta DOT)*real(v Cx)
 + imag(v Cx)*real(theta DOT))*((real(m)*(imag(r)^2 - real(r)^2) +
 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(d) + real(I wL)*imag(d)) - (imag(m)*(imag(r)^2
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(d) - real(I wL)*real(d))) -
 (imag(theta DOT)*imag(v Cx) - real(theta DOT)*real(v Cx))*((imag(m)*(imag(r)^2 - real(r)^2))*(imag(m)*(imag(m)*(imag(m)))*(imag(m)*(imag(m)))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(i
 -2*imag(r)*real(m)*real(r))*(imag(I wL)*real(d) + real(I wL)*imag(d)) + (real(m)*(imag(r)^2)
 - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(d) - real(I wL)*real(d))) +
  (imag(theta DOT)*real(v Cx) + imag(v Cx)*real(theta DOT))*((real(m)*(imag(r)^2 - real(r)^2))
 + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*real(d) + real(I wR)*imag(d)) - (imag(m)*(imag(r)^2
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(d) - real(I wR)*real(d)))
 real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wR)*real(d) + real(I_wR)*imag(d)) + real(r)*imag(d) 
  (\text{real}(\text{m}) * (\text{imag}(\text{r}) ^2 - \text{real}(\text{r}) ^2) + 2* \text{imag}(\text{m}) * \text{imag}(\text{r}) * \text{real}(\text{r})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{d}) - \text{real}(\text{r})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{d})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{d})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{d})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{I}_w\text{R})) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{I}_w\text{R}))) * (\text{imag}(\text{I}_w\text{R}) * \text{imag}(\text{I}_w\text{R})) * (\text{imag}(\text{I}_w\text{R})) * (
 - \ \text{real}(\texttt{d}) \ \text{*real}(\texttt{m})) \ + \ (\text{imag}(\texttt{I}\_\texttt{wL}) \ \text{*imag}(\texttt{L}) \ - \ \text{real}(\texttt{I}\_\texttt{wL}) \ \text{*real}(\texttt{L})) \ \text{*} \ (\text{imag}(\texttt{d}) \ \text{*real}(\texttt{m})
 + real(d)*imag(m)))*(imag(theta DOT)*(real(theta DOT)*(imag(r)^2 - real(r)^2) +
 2*imag(r)*imag(theta\_DOT)*real(r)) - real(theta\_DOT)*(imag(theta\_DOT)*(imag(r)^2 - real(r)^2) - real(r)^2 - real
  2*imag(r)*real(r)*real(theta\_DOT))) - ((imag(I\_wL)*real(L) + imag(L)*real(I\_wL))*(imag(d)*real(m) + imag(L)*real(L) + imag(L)*real(L)*real(L) + imag(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*real(L)*rea
 + \ \operatorname{real}\left(d\right) * \operatorname{imag}\left(m\right)\right) \ - \ \left(\operatorname{imag}\left(I_{\underline{w}L}\right) * \operatorname{imag}\left(L\right) \ - \ \operatorname{real}\left(I_{\underline{w}L}\right) * \operatorname{real}\left(L\right)\right) * \left(\operatorname{imag}\left(d\right) * \operatorname{imag}\left(m\right)\right) + \left(\operatorname{imag}\left(m\right) *
 - real(d)*real(m)))*(imag(theta DOT)*(imag(theta DOT)*(imag(r)^2 - real(r)^2 - real(r)^2
 2*imag(r)*real(r)*real(theta_DOT)) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^2 - real(r)^2) + real(theta_DOT)*(real(theta_DOT))*(imag(r)^2 - real(r)^2) + real(theta_DOT)*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_DOT))*(real(theta_
 2*imag(r)*imag(theta\_DOT)*real(r))) + ((imag(I\_wR)*real(L) + imag(L)*real(I\_wR))*(imag(d)*imag(m)) + (imag(I\_wR))*(imag(M)*imag(M)*(imag(M)*imag(M)*(imag(M)*imag(M)*(imag(M)*(imag(M)*imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)*(imag(M)
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-\ \text{real(d)*real(m))}\ +\ (\text{imag(I\_wR)*imag(L)}\ -\ \text{real(I\_wR)*real(L))*(imag(d)*real(m)}
+ real(d)*imag(m)))*(imag(theta DOT)*(real(theta DOT)*(imag(r)^2 - real(r)^2) +
 2*imag(r)*imag(theta_DOT)*real(r)) - real(theta_DOT)*(imag(theta_DOT)*(imag(r)^2 - real(r)^2) - real(r)^2
 2*imag(r)*real(r)*real(theta DOT))) + ((imag(I wR)*real(L) + imag(L)*real(I wR))*(imag(d)*real(m))
 + real(d)*imag(m)) - (imag(I wR)*imag(L) - real(I wR)*real(L))*(imag(d)*imag(m)
 - real(d)*real(m)))*(imag(theta DOT)*(imag(theta DOT)*(imag(r)^2 - real(r)^2 - real(r)^2
 2*imag(r)*real(r)*real(theta DOT)) + real(theta DOT)*(real(theta DOT)*(imag(r)^2 - real(r)^2)
 + 2*imag(r)*imag(theta DOT)*real(r))) + imag(v Cx)*((real(theta DOT)*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2)*(real(d)*(imag(m)^2 - real(m)^2) + 2*imag(d)*imag(m)*real(m))
 + (real(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 imag(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(d)*(imag(m)^2 - 4*imag(r)^3*real(r)))*(imag(d)*(imag(m)^2 - 4*imag(m)^3*real(m)))*(imag(m)^2 - 4*imag(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)^3*real(m)
 real(m)^2 - 2*real(d)*imag(m)*real(m)) + real(v Cx)*((real(theta DOT)*(4*imag(r)*real(r)^3)
 - 4*imag(r)^3*real(r) + imag(theta_DOT)*(imag(r)^4 + real(r)^4 - real(r)^4
 6*imag(r)^2*real(r)^2)*(imag(d)*(imag(m)^2 - real(m)^2) - 2*real(d)*imag(m)*real(m))
 - (real(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 imag(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(real(d)*(imag(m)^2 -
 \texttt{real} (\texttt{m}) \, ^2) \, + \, 2 \, \texttt{imag} (\texttt{d}) \, \texttt{imag} (\texttt{m}) \, \texttt{*real} (\texttt{m}))) \, - \, 2 \, \texttt{*imag} (\texttt{theta\_DOT}) \, \texttt{*} \, (\, (\, \texttt{imag} \, (\, \texttt{I\_wR}) \, \texttt{*real} \, (\, \texttt{L}) \, )) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, \texttt{*real} \, (\, \texttt{L}) \, + \, 2 \, \texttt{*imag} (\texttt{m}) \, + \, 2 \, \texttt{*imag} (\texttt{m
 + imag(L)*real(I wR))*(imag(L)*imag(bL) + real(L)*real(bL)) + (imag(I_wR)*imag(L) - Imag(I_wR)*imag(L) + Imag(I_
 + imag(L)*real(I_wL))*(imag(L)*imag(bR) + real(L)*real(bR)) + (imag(I_wL)*imag(L) - (imag(L)*real(bR)) + (imag(I_wL)*real(bR)) + (imag(I_wL)*real(bR
 + imag(L) *real(I wR)) * (imag(L) *real(bL) - real(L) *imag(bL)) - (imag(I wR) *imag(L) -
 real(I wR)*real(L))*(imag(L)*imag(bL) + real(L)*real(bL))) - 2*real(theta DOT)*((imag(I wL)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag
 + imag(L)*real(I_wL))*(imag(L)*real(bR) - real(L)*imag(bR)) - (imag(I_wL)*imag(L) - real(L)*imag(L) - real(L)*imag(L) - real(L)*imag(L) - real(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*im
 real(I_wL)*real(L))*(imag(L)*imag(bR) + real(L)*real(bR))) + (imag(I_wR)*real(L) + real(L)*real(BR))) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR)) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR)) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR))) + (imag(I_wR)*real(BR)) + (imag(I_wR)*r
 imag(L)*real(I wR))*(2*imag(TaL)*real(r) + 2*real(TaL)*imag(r)) - (imag(I wR)*imag(L) - (imag(I wR))*(imag(I wR))*(imag(
 real(I wR) * real(L)) * (2*imag(TaL)*imag(r) - 2*real(TaL)*real(r)) - (imag(I wL)*real(L) + (2*imag(TaL)*real(L)) + (2*imag(
 imag(L)*real(I wL))*(2*imag(TaR)*real(r) + 2*real(TaR)*imag(r)) + (imag(I wL)*imag(L) -
 real(I wL)*real(L))*(2*imag(TaR)*imag(r) - 2*real(TaR)*real(r)) + imag(v Cx)*((real(m)*(imag(r)^2 - 2*real(TaR)*real(r))) + imag(v Cx)*((real(m)*(imag(r)^2 - 2*real(TaR)*real(r))))
 real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) - (imag(m)*(imag(r)^2)
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bL) - real(L)*real(bL))) -
 imag(v Cx)*((real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bR) + 2*imag(m)*imag(r)*(imag(L)*real(bR) + 2*imag(m)*imag(r)*(imag(L)*real(bR) + 2*imag(m)*imag(r)*(imag(L)*real(bR) + 2*imag(m)*(imag(L)*real(r))*(imag(L)*real(bR) + 2*imag(m)*(imag(L)*real(r))*(imag(L)*real(bR) + 2*imag(m)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(bR) + 2*imag(m)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(imag(L)*real(r))*(imag(L)*(
 real(L)*imag(bR)) - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bR))
 - real(L)*real(bR))) + 2*imag(v Cx)*((real(m wR)*(imag(r)^2 - real(r)^2))
 + 2*imag(m wR)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) -
  (imag(m wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(L)*imag(bL)
 - real(L) * real(bL))) - 2* imag(v Cx) * ((real(m wL) * (imag(r)^2 - real(r)^2))
 + 2*imag(m wL)*imag(r)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) -
 (imag(m_wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wL)*real(r))*(imag(L)*imag(bR))
  - real(L)*real(bR))) + real(v Cx)*((imag(m)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) + (real(m)*(imag(r)^2)
 - real(r)^2 + 2 imag(m) imag(r) real(r) (imag(L) imag(bL) - real(L) real(bL)) -
 real(v Cx)*((imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bR) + (imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(
 real(L)*imag(bR)) + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bR))
 - real(L) * real(bR))) + 2* real(v Cx) * ((imag(m wR) * (imag(r)^2 - real(r)^2))
 -2*imag(r)*real(m wR)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) +
 (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(L)*imag(bL)
 - \text{real}(L) \text{*real}(bL))) - 2\text{*real}(v Cx) * ((imag(m wL) * (imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m wL)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) + (real(m wL)*(imag(r)^2
 - real(r)^2 + 2*imag(m wL)*imag(r)*real(r))*(imag(L)*imag(bR) - real(L)*real(bR)))
 + ((imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bL) +
 real(L)*imag(bL)) + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bL))
 - real(L)*real(bL)))*(imag(L)*imag(theta DOT) - real(L)*real(theta DOT)) + ((real(m)*(imag(r)^2) - real(L)*real(theta DOT)) + ((real(m)*(imag(r)^2) - real(L)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(n)*(imag(
 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) -
 (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bL) - 2*imag(r)*real(m)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(
 \texttt{real} (\texttt{L}) * \texttt{real} (\texttt{bL}))) * (\texttt{imag} (\texttt{L}) * \texttt{real} (\texttt{theta\_DOT}) + \texttt{real} (\texttt{L}) * \texttt{imag} (\texttt{theta\_DOT})) + ((\texttt{imag} (\texttt{m}) * (\texttt{imag} (\texttt{r}) ^2 \texttt{m}))) + (\texttt{imag} (\texttt{m}) * (\texttt{imag} (\texttt{imag} (\texttt{m}) * (\texttt{imag} (\texttt{imag} (\texttt{m}) * (\texttt{imag} (
 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bR) - real(m)*(imag(r)^2 - real(r)^2)
 real(L)*real(bR)))*(imag(L)*imag(theta DOT) - real(L)*real(theta DOT)) + ((real(m)*(imag(r)^2))*(imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))
 - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) -
 (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bR) - 2*imag(r)*real(m)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))
 real(L)*real(bR)))*(imag(L)*real(theta_DOT) + real(L)*imag(theta_DOT)) + ((imag(m_wR)*(imag(r)^2L)))
 - real(r)^2) - 2*imag(r)*real(m_wR)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) + real(BL)*imag(bL)) + real(BL)*imag(bL)*imag(bL)) + real(BL)*imag(bL)*imag(bL)) + real(BL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*imag(bL)*i
  (\text{real}(\text{m\_wR}) * (\text{imag}(\text{r}) ^2 - \text{real}(\text{r}) ^2) + 2* \text{imag}(\text{m\_wR}) * \text{imag}(\text{r}) * \text{real}(\text{r})) * (\text{imag}(\text{L}) * \text{imag}(\text{bL})
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- real(L)*real(bL)))*(2*imag(L)*imag(theta_DOT) - 2*real(L)*real(theta_DOT)) +
((real(m WR)*(imag(r)^2 - real(r)^2) + 2*imag(m WR)*imag(r)*real(r))*(imag(L)*real(bL) + 2*imag(m WR)*imag(r)*real(r))*(imag(L)*real(bL) + 2*imag(m WR)*imag(r)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(
real(L)*imag(bL)) - (imag(m wR)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wR)*real(r))*(imag(L)*imag(bL) - real(L)*real(bL)))*(2*imag(L)*real(theta DOT)
+ 2*real(L)*imag(theta DOT)) + ((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wL)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) +
(real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(L)*imag(bR)
- real(L)*real(bR)))*(2*imag(L)*imag(theta DOT) - 2*real(L)*real(theta DOT)) +
((real(m WL)*(imag(r)^2 - real(r)^2) + 2*imag(m WL)*imag(r)*real(r))*(imag(L)*real(bR) +
real(L)*imag(bR)) - (imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wL)*real(r))*(imag(L)*imag(bR) - real(L)*real(bR)))*(2*imag(L)*real(theta DOT) +
2 = 2 = (L) = (D) = (2 = (D)) = (2 = (D)
+ imag(L) *real(I wR)) + (2*imag(bL)*imag(v Cx) - 2*real(bL)*real(v Cx))*(imag(I wR)*imag(L)
- real(I wR)*real(L)) + (2*imag(bR)*real(v Cx) + 2*real(bR)*imag(v Cx))*(imag(I wL)*real(L)
+ imag(L) *real(I wL)) - (2*imag(bR) *imag(v Cx) - 2*real(bR) *real(v Cx)) * (imag(I wL) *imag(L) -
real(I wL)*real(L)) + (imag(theta_DOT)*real(v_Cx) +
imag(v Cx)*real(theta DOT))*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real (m \text{ wL}) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(d)*imag(m) - real(d)*real(m)) -
(real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(d)*real(m) + real(d)*imag(m))) + (imag(theta DOT)*imag(v Cx)
- real(theta_DOT)*real(v_Cx))*((imag(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
(real(m WL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WL)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(d)*imag(m) - real(d)*real(m))) + (imag(theta DOT)*real(v Cx))
+ imag(v_Cx)*real(theta_DOT))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + imag(v_Cx)*real(theta_DOT))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + imag(r)^4 + real(r)^4 + 
real(m_wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(d)*imag(m) - real(d)*real(m)) - real(d)*real(m) - real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*re
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(d)*real(m) + real(d)*imag(m))) + (imag(theta DOT)*imag(v Cx)
- real(theta DOT)*real(v Cx))*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
+ real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(d)*real(m) + 4*imag(r)*real(m) + 4*imag(m) +
real(d)*imag(m)) + (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
imag(m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(d)*imag(m) - real(d)*real(m))))
== (4*imag(L)*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
 real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m wL) - real(L)*real(m wL)) 
- (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3 -
4*imag(r)^3*real(r))*(imag(L)*real(m_wL) + real(L)*imag(m_wL))) + (imag(m)*(imag(r)^2 - real(r)^2)
- 2*imag(r)*real(m)*real(r))*(imag(I_wL)*(imag(d)^2 - real(d)^2) - 2*real(I wL)*imag(d)*real(d))
         (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I wL)*(imag(d)^2)
 - \text{ real}(d)^2 + 2 \text{ imag}(I \text{ wL}) \text{ imag}(d) \text{ real}(d) + (imag(m) \text{ (imag}(r)^2 - real(r)^2) -
2*imag(r)*real(m)*real(r))*(imag(I_wR)*(imag(d)^2 - real(d)^2) - 2*real(I_wR)*imag(d)*real(d))
- (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(real(I_wR)*(imag(d)^2 - real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(m))*(real(
 real(d)^2) + 2*imag(I_wR)*imag(d)*real(d)) + real(L)*((imag(m_wL)*(imag(r)^4 + real(r)^4 - real(r)^4)) + real(L)*((imag(m_wL)*(imag(r)^4 + real(r)^4)) + real(L)*((imag(m_wL)*(imag(r)^4 + real(r)^4))) + real(L)*((imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_wL)*(imag(m_w
6*imag(r)^2*real(r)^2 + real(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
+ \text{ real}(L) * imag(m)) + (real(m wL) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2)
-imag(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(m) - 
real(L)*real(m))) + real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
real(m \ wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) + real(L)*imag(m)) +
(real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m))) - (2*imag(d)*real(d)*(imag(m)^2)
- \text{ real (m) }^2 + 2 \times \text{imag (m) } \times \text{real (m) } \times \text{(imag (d) }^2 - \text{ real (d) }^2) \times (4 \times \text{imag (r) } \times \text{real (r) }^3 - \text{real (m) }^2
4*imag(r)^3*real(r) + 4*real(L)*((imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + 4*real(r)^2*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2
real (m wR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m wL) + real(L)*imag(m wL))
+ (real(m WR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m WR)*(4*imag(r)*real(r)^3)
-4*imag(r)^3*real(r))*(imag(L)*imag(m wL) - real(L)*real(m wL))) + imag(L)*((real(m)*(imag(r)^2))*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(imag(m)*(i
- \ \text{real}(\texttt{r}) \,^2) \,\, + \,\, 2 \,^* \text{imag}(\texttt{m}) \,^* \text{imag}(\texttt{r}) \,^* \text{real}(\texttt{r})) \,^* \,^* \,^* \text{imag}(\texttt{I}_\texttt{wL}) \,^* \text{real}(\texttt{L}) \,\, + \,\, \text{imag}(\texttt{L}) \,^* \text{real}(\texttt{I}_\texttt{wL}))
- (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I_wL)*imag(L)
- real(I wL)*real(L))) + imag(L)*((real(m)*(imag(r)^2 - real(r)^2) +
2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) -
(imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((real(m wL)*(imag(r)^2 - real(r)^2) +
 2*imag(m_wL)*imag(r)*real(r))*(imag(I_wR)*real(L) + imag(L)*real(I_wR)) - \\
(imag(m wL)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wL)*real(r))*(imag(I wR)*imag(L))
- real(I wR)*real(L))) + 4*imag(L)*((real(m wR)*(imag(r)^2 - real(r)^2) +
2*imag(m_wR)*imag(r)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) -
 (imag(m_wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m_wR)*real(r))*(imag(I_wL)*imag(L)*imag(L)*(imag(m_wR)*real(r))*(imag(m_wR)*real(r))*(imag(m_wR)*real(r))*(imag(m_wR)*real(r))*(imag(m_wR)*real(r))*(imag(m_wR)*real(r))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(imag(m_wR))*(i
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- real(I_wL)*real(L))) - real(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m)*real(r))*(imag(I_wL)*real(L) + imag(L)*real(I_wL)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(L))
 - real(I wL)*real(L))) - real(L)*((imag(m)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(m)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
 (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(L)
 - real(I wR)*real(L))) - 4*real(L)*((imag(m wL)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(m wL)*real(r))*(imag(I wR)*real(L) + imag(L)*real(I wR)) +
 (real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(I wR)*imag(L))
 - real(I wR) * real(L))) - 4 * real(L) * ((imag(m wR) * (imag(r)^2 - real(r)^2) - real(r)^2) - real(r)^2 - real(
2*imag(r)*real(m wR)*real(r))*(imag(I wL)*real(L) + imag(L)*real(I wL)) + (real(m wR)*(imag(r)^2
 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(I wL)*imag(L) - real(I wL)*real(L))) +
 (imag(I zz)*imag(m) - real(I zz)*real(m))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
  (imag(I zz)*imag(m wL) - real(I zz)*real(m wL))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
  (imag(Izz)*imag(mwR) - real(Izz)*real(mwR))*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - 6*imag(mwR)
  ((imag(d)^2 - real(d)^2)*(imag(m)^2 - real(m)^2) - 4*imag(d)*real(d)*imag(m)*real(m))*(imag(r)^4)
 + \ \operatorname{real}(r)^4 - 6 \operatorname{imag}(r)^2 \operatorname{real}(r)^2) - (\operatorname{imag}(\operatorname{I_wL}) \operatorname{imag}(\operatorname{I_zz}) - \operatorname{real}(\operatorname{I_wL}) \operatorname{real}(\operatorname{I_zz})) \operatorname{*}(\operatorname{imag}(r)^2 + \operatorname{real}(\operatorname{I_wL}) \operatorname{*}(\operatorname{I_wL}) \operatorname{*}(\operatorname{I_
 - real(r)^2 - (imag(I_wR)*imag(I_zz) - real(I_wR)*real(I_zz))*(imag(r)^2 - real(r)^2) - real(r)^2 - 
 (imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
 (real(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m_wL)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) -
 (imag(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wR)*(4*imag(r)*real(r)^3)
 -4*imag(r)^3*real(r))*(imag(m)*(imag(d)^2 - real(d)^2) - 2*imag(d)*real(d)*real(m)) +
  (\text{real}\,(\text{m\_wR})\,*\,(\text{imag}\,(\text{r})\,^4\,+\,\text{real}\,(\text{r})\,^4\,-\,6\,*\,\text{imag}\,(\text{r})\,^2\,*\,\text{real}\,(\text{r})\,^2)\,\,-\,\,\text{imag}\,(\text{m\_wR})\,*\,(4\,*\,\text{imag}\,(\text{r})\,*\,\text{real}\,(\text{r})\,^3) 
 -4*imag(r)^3*real(r))*(real(m)*(imag(d)^2 - real(d)^2) + 2*imag(d)*real(d)*imag(m)) + 2*imag(m)*real(d)*imag(m)) + 2*imag(m)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real(d)*real
4*abs(L)^2*(imag(I wL)*imag(I wR)) - real(I wL)*real(I wR)) + imag(L)*((imag(m wL)*(imag(r)^4 wL)) + imag(L)*(imag(m wL))*(imag(m wL)
 + real(r)^4 - 6*imag(r)^2*real(r)^2) + real(m wL)*(4*imag(r)*real(r)^3 - 6*imag(r)^2*real(r)^3 + real(m)^4 - 6*imag(r)^4 - 6*imag(r)^4 + real(m)^4 - 6*imag(m)^4 + real(m)^4 - 6*imag(m)^4 - 6*imag(m)
 4*imag(r)^3*real(r))*(imag(L)*imag(m) - real(L)*real(m)) - (real(m wL)*(imag(r)^4 + real(r)^4 - real(m)))*(imag(r)^4 + real(r)^4 - real(m))*(imag(r)^4 + real(m))*(imag(r)^4 +
 6*imag(r)^2*real(r)^2 - imag(m wL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))*(imag(L)*real(m)
 + \text{ real}(L) * imag(m))) + imag(L) * ((imag(m_wR) * (imag(r)^4 + real(r)^4 - 6* imag(r)^2* real(r)^2)
 + real(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*imag(m) - 4*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(r)*imag(
 real(L)*real(m)) - (real(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)
 -imag(m WR)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(L)*real(m) +
  \label{eq:continuous}  \mbox{real(L)*imag(m))) + (imag(I_zz)*real(m) + real(I_zz)*imag(m))*(4*imag(r)*real(r)^3 - 1)   \mbox{real(L)*imag(m))}  \mbox{ } \mbox{real(m))}  \mbox{ } \mbox{real(m)}  \mbox{ } \mbox{real(m))}  \mbox{ } \mbox{ } \mbox{real(m))}  \mbox{ } \mbox{ } \mbox{real(m))}  \mbox{ } \mb
 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wL) + real(I zz)*imag(m wL))*(4*imag(r)*real(r)^3
 - 4*imag(r)^3*real(r)) + (imag(I zz)*real(m wR) + real(I zz)*imag(m wR))*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + 2*imag(r)*real(r)*(imag(I wL))*real(I zz) + imag(I zz)*real(I wL))
 + 2*imag(r)*real(r)*(imag(I wR)*real(I_zz) + imag(I_zz)*real(I_wR)))*((imag(m)*(real(r)^3
              3*imag(r)^2*real(r) - real(m)*(imag(r)^3 - 3*imag(r)*real(r)^2))*(imag(L)*imag(TaL)
 - \text{ real}(L) \text{ *real}(TaL)) - (imag(m) * (imag(r) ^3 - 3*imag(r) * real(r) ^2) + real(m) * (real(r) ^3)
 -3*imag(r)^2*real(r))*(imag(L)*real(TaL) + imag(TaL)*real(L)) + (imag(m)*(imag(r)^3 - imag(r)^2*real(L))) + (imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m
 3*imag(r)*real(r)^2) + real(m)*(real(r)^3 - 3*imag(r)^2*real(r)))*(imag(L)*real(TaR) + 3*imag(r)*real(r)^2)
 imag(TaR)*real(L)) - (imag(m)*(real(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(r)^3 - 3*imag(r)^2*real(r)) - real(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m)
 3*imag(r)*real(r)^2)*(imag(L)*imag(TaR) - real(L)*real(TaR)) - (imag(m wR)*(imag(r)^3 - real(L)*real(TaR)) - (imag(m wR)*(imag(r)^3 - real(L)*real(TaR)) - (imag(m wR))*(imag(m wR))*(ima
 3*imag(r)*real(r)^2) + real(m wR)*(real(r)^3 - 3*imag(r)^2*real(r)))*(2*imag(L)*real(TaL)
 + 2*imag(TaL)*real(L)) + (imag(m wR)*(real(r)^3 - 3*imag(r)^2*real(r)) -
 real(m WR)*(imag(r)^3 - 3*imag(r)*real(r)^2))*(2*imag(L)*imag(TaL) - 2*real(L)*real(TaL))
 + (imag(m wL)*(imag(r)^3 - 3*imag(r)*real(r)^2) + real(m wL)*(real(r)^3 - 3*imag(r)*real(r)^2)
 3*imag(r)^2*real(r))*(2*imag(L)*real(TaR) + 2*imag(TaR)*real(L)) - (imag(m wL)*(real(r)^3)
 -3*imag(r)^2*real(r) - real(m wL)*(imag(r)^3 - 3*imag(r)*real(r)^2))*(2*imag(L)*imag(TaR)
 - 2*real(L)*real(TaR)) + (imag(theta DOT)*(real(theta DOT)*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^4 +
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta_DOT)*(4*imag(r)*real(r)^3 - imag(r)^4 - 6*imag(r)^2*real(r)^3 - imag(r)^4 - 6*imag(r)^4 - 6*i
 4*imag(r)^3*real(r)))*((imag(m)*real(m_wL) + imag(m_wL)*real(m))*(imag(L)*imag(d))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(
 - real(L) * real(d)) + (imag(m) * imag(m wL) - real(m) * real(m wL)) * (imag(L) * real(d)
 + real(L)*imag(d))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*imag(d))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*imag(d)))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*imag(d)))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*imag(d)))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*imag(d)))) - (imag(theta_DOT)*(real(theta_DOT)*(imag(r)^4 + real(L)*(imag(r)^4 
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 - imag(r)^4 - 6*imag(r)^2*real(r)^3 - imag(r)^4 - 6*imag(r)^4 - 6*i
 4*imag(r)^3*real(r)) - real(theta DOT)*(real(theta DOT)*(4*imag(r)*real(r)^3
-4*imag(r)^3*real(r)) + imag(theta_DOT)*(imag(r)^4 + real(r)^4 -
6*imag(r)^2*real(r)^2)))*((imag(m)*real(m_wL) + imag(m_wL)*real(m))*(imag(L)*real(d)))
+ \ \text{real} \ (\texttt{L}) \ \text{*imag} \ (\texttt{d}) \ ) \ - \ (\text{imag} \ (\texttt{m}) \ \text{*imag} \ (\texttt{m}\_\texttt{wL}) \ - \ \text{real} \ (\texttt{m}) \ \text{*real} \ (\texttt{m}\_\texttt{wL}) \ ) \ \text{*} \ (\text{imag} \ (\texttt{L}) \ \text{*imag} \ (\texttt{d})
 - real(L)*real(d))) - (imag(theta DOT)*(real(theta DOT)*(4*imag(r)*real(r)^3
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
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6*imag(r)^2*real(r)^2) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^4 +
 real(r)^4 - 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 - imag(r)^4 - 6*imag(r)^4 - 6*imag(r)^6 - imag(r)^6 - imag(r)^6
 4*imag(r)^3*real(r)))*((imag(m)*real(m_wR) + imag(m_wR)*real(m))*(imag(L)*imag(d))*(imag(m)*real(m))*(imag(m)*real(m))*(imag(m)*real(m))*(imag(m)*real(m))*(imag(m)*real(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(
 - real(L)*real(d)) + (imag(m)*imag(m wR) - real(m)*real(m wR))*(imag(L)*real(d)
 + real(L)*imag(d))) + (imag(theta DOT)*(real(theta DOT)*(imag(r)^4 + real(r)^4 - real(L)*imag(d)))) + (imag(theta DOT)*(real(theta DOT)*(imag(r)^4 + real(r)^4 - real(L)*imag(d)))) + (imag(theta DOT)*(real(theta DOT)*(imag(r)^4 + real(r)^4 - real(L)*(imag(d))))) + (imag(theta DOT)*(real(theta DOT)*(imag(r)^4 + real(r)^4 - real(L)*(imag(d))))) + (imag(theta DOT)*(imag(r)^4 + real(r)^4 - 
 6*imag(r)^2*real(r)^2 - imag(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))
 - real(theta DOT)*(real(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)) +
 imag(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2))*((imag(m)*real(m wR))
 + imag(m wR) * real(m)) * (imag(L) * real(d) + real(L) * imag(d)) - (imag(m) * imag(m wR) -
 real(m)*real(m wR))*(imag(L)*imag(d) - real(L)*real(d))) + (imag(theta DOT)*real(v Cx)
 + imag(v_Cx)*real(theta_DOT))*((imag(m)*(imag(r)^2 - real(r)^2) - real(r)^2)
2*imag(r)*real(m)*real(r))*(imag(I wL)*real(d) + real(I wL)*imag(d)) + (real(m)*(imag(r)^2 vL)*real(d) + real(m)*(imag(m)*real(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(im
 - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*imag(d) - real(I wL)*real(d))) +
 (imag(theta\ DOT)*imag(v\ Cx)\ -\ real(theta\ DOT)*real(v\ Cx))*((real(m)*(imag(r)^2\ -\ real(r)^2))*(imag(r)^2\ -\ real(r)^2))*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2)*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2)*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2\ -\ real(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(imag(r)^2)*(i
 + 2*imag(m)*imag(r)*real(r))*(imag(I wL)*real(d) + real(I wL)*imag(d)) - (imag(m)*(imag(r)^2)
 - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(I wL)*imag(d) - real(I wL)*real(d))) +
 (imag(theta\_DOT)*real(v\_Cx) + imag(v\_Cx)*real(theta\_DOT))*((imag(m)*(imag(r)^2 - real(r)^2)) + (imag(m)*(imag(m)*(imag(m))^2 - real(r)^2)) + (imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(ima
 - 2*imag(r)*real(m)*real(r))*(imag(I wR)*real(d) + real(I wR)*imag(d)) + (real(m)*(imag(r)^2
 - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(I wR)*imag(d) - real(I wR)*real(d))
 + (imag(theta DOT)*imag(v Cx) - real(theta DOT)*real(v Cx))*((real(m)*(imag(r)^2 - real(theta DOT))*real(v Cx))*((real(m)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(imag(r)*(ima
 real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(I_wR)*real(d) + real(I_wR)*imag(d)) - real(r)^2
 (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(I wR)*imag(d) - 2*imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*
 real(I wR)*real(d))) - ((imag(I wL)*real(L) + imag(L)*real(I wL))*(imag(d)*imag(m)
 - real(d)*real(m)) + (imag(I wL)*imag(L) - real(I wL)*real(L))*(imag(d)*real(m)
 + real(d)*imag(m)))*(imag(theta_DOT)*(imag(theta_DOT)*(imag(r)^2 - real(r)^2) -
 2*imag(r)*real(r)*real(theta_DOT)) + real(theta_DOT)*(real(theta_DOT)*(imag(r)^2 - real(r)^2) + real(r)^2
 2*imag(r)*imag(theta DOT)*real(r))) + ((imag(I wL)*real(L) + imag(L)*real(I wL))*(imag(d)*real(m))
+ real(d)*imag(m)) - (imag(I wL)*imag(L) - real(I wL)*real(L))*(imag(d)*imag(m)
 - real(d) * real(m))) * (imag(theta DOT) * (real(theta DOT) * (imag(r)^2 - real(r)^2) +
2*imag(r)*imag(theta DOT)*real(r)) - real(theta DOT)*(imag(theta DOT)*(imag(r)^2 - real(r)^2) - real(r)^2
2*imag(r)*real(r)*real(theta_DOT))) + ((imag(I_wR)*real(L) + imag(L)*real(I_wR))*(imag(d)*imag(m)) + (imag(I_wR))*(imag(m)) + (imag(I_wR))*(imag(m))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR))*(imag(I_wR
 - real(d)*real(m)) + (imag(I wR)*imag(L) - real(I wR)*real(L))*(imag(d)*real(m)
+ real(d)*imag(m)))*(imag(theta_DOT)*(imag(theta_DOT)*(imag(r)^2 - real(r)^2) -
2*imag(r)*real(r)*real(theta DOT)) + real(theta DOT)*(real(theta DOT)*(imag(r)^2 - real(r)^2) +
2*imag(r)*imag(theta DOT)*real(r))) - ((imag(I wR)*real(L) + imag(L)*real(I wR))*(imag(d)*real(m)))
 + \ real(d)*imag(m)) - (imag(I_wR)*imag(L) - real(I_wR)*real(L))*(imag(d)*imag(m)
 - real(d)*real(m)))*(imag(theta DOT)*(real(theta DOT)*(imag(r)^2 - real(r)^2) +
 2*imag(r)*imag(theta DOT)*real(r)) - real(theta DOT)*(imag(theta DOT)*(imag(r)^2 - real(r)^2)
              2*imag(r)*real(r)*real(theta DOT))) + imag(v Cx)*((real(theta DOT)*(4*imag(r)*real(r)^3
              4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2)*(imag(d)*(imag(m)^2 - real(m)^2) - 2*real(d)*imag(m)*real(m))
 - (real(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2 -
 imag(theta_DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(real(d)*(imag(m)^2 - 4*imag(m)^2 - 4
 real(m)^2 + 2*imag(d)*imag(m)*real(m))) - real(v Cx)*((real(theta DOT)*(4*imag(r)*real(r)^3))
 -4*imag(r)^3*real(r)) + imag(theta DOT)*(imag(r)^4 + real(r)^4 -
 6*imag(r)^2*real(r)^2)*(real(d)*(imag(m)^2 - real(m)^2) + 2*imag(d)*imag(m)*real(m))
 + (real(theta DOT)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) -
 imag(theta DOT)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(d)*(imag(m)^2 - 4*imag(m)^2 - 4
 real(m)^2 - 2real(d) imag(m) real(m)) + 2imag(theta DOT) (imag(I wR) real(L))
 + imag(L)*real(I wR))*(imag(L)*real(bL) - real(L)*imag(bL)) - (imag(I wR)*imag(L) - real(L)*imag(L)) - (imag(I wR)*imag(L) - real(L)*imag(L)) - real(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag(L)*imag
 real(I \ wR) * real(L)) * (imag(L) * imag(bL) + real(L) * real(bL))) + 2* imag(theta DOT) * ((imag(I \ wL) * real(L) * real(
 + imag(L) *real(I wL)) * (imag(L) *real(bR) - real(L) *imag(bR)) - (imag(I wL) *imag(L) -
 real(I wL)*real(L))*(imag(L)*imag(bR) + real(L)*real(bR))) - 2*real(theta DOT)*((imag(I wR)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*r
 + imag(L)*real(I wR))*(imag(L)*imag(bL) + real(L)*real(bL)) + (imag(I wR)*imag(L) - (imag(L) wR))*(imag(L) + (imag(L) wR))*(imag(L) wR))*(im
 real(I \ wR) * real(L)) * (imag(L) * real(bL) - real(L) * imag(bL))) - 2* real(theta DOT) * ((imag(I \ wL) * real(L) * real(
 + imag(L)*real(I_wL))*(imag(L)*imag(bR) + real(L)*real(bR)) + (imag(I_wL)*imag(L) - (imag(L)*real(bR)) + (imag(I_wL)*real(bR)) + (imag(I_wL)*real(bR
 real(I WL)*real(L))*(imag(L)*real(bR) - real(L)*imag(bR))) + (imag(I WR)*real(L) + real(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L))*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*(imag(L)*real(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag(L)*(imag
 imag(L)*real(I_wR))*(2*imag(TaL)*imag(r) - 2*real(TaL)*real(r)) + (imag(I_wR)*imag(L) - 2*real(TaL)*real(r)) + (imag(I_wR)*imag(L) - 2*real(TaL)*real(r)) + (imag(I_wR))*real(r) + (i
 real(I wR)*real(L))*(2*imag(TaL)*real(r) + 2*real(TaL)*imag(r)) - (imag(I wL)*real(L) + 2*real(L) + 2*r
 imag(L) *real(I wL)) * (2*imag(TaR) *imag(r) - 2*real(TaR) *real(r)) - (imag(I wL) *imag(L) -
 real(I wL)*real(L))*(2*imag(TaR)*real(r) + 2*real(TaR)*imag(r)) + imag(v Cx)*((imag(m)*(imag(r)^2 - Cx))*((imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m)
 real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) + (real(m)*(imag(r)^2)
 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bL) - real(L)*real(bL))) -
 imag(v_Cx)*((imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bR) + (imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(
 real(L)*imag(bR)) + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bR))
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- real(L) * real(bR))) + 2* imag(v_Cx) * ((imag(m_wR) * (imag(r)^2 - real(r)^2))
       -2*imag(r)*real(m wR)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) +
       (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(L)*imag(bL)
       - real(L)*real(bL))) - 2*imag(v_Cx)*((imag(m_wL)*(imag(r)^2 - real(r)^2)
       -2*imag(r)*real(m wL)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) +
       (real(m wL)*(imag(r)^2 - real(r)^2) + 2*imag(m wL)*imag(r)*real(r))*(imag(L)*imag(bR)
       - \text{real}(L) \text{*real}(bR))) - \text{real}(v Cx) *((\text{real}(m) * (\text{imag}(r)^2 - \text{real}(r)^2) +
      2*imag(m)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) - (imag(m)*(imag(r)^2)
       - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bL) - real(L)*real(bL))) +
       real(v Cx)*((real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bR) + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bR) + 2*imag(m)*imag(r)*real(r))*(imag(r)*real(bR) + 2*imag(m)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(
       real(L)*imag(bR)) - (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bR))
       - real(L)*real(bR))) - 2*real(v Cx)*((real(m wR)*(imag(r)^2 - real(r)^2)
       + 2*imag(m wR)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) -
       (imag(m wR)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(L)*imag(bL)
       - real(L) * real(bL))) + 2 * real(v Cx) * ((real(m wL) * (imag(r)^2 - real(r)^2) +
       2*imag(m wL)*imag(r)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) - (imag(m wL)*(imag(r)^2
       - real(r)^2 - 2*imag(r)*real(m wL)*real(r))*(imag(L)*imag(bR) - real(L)*real(bR)))
       + ((imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bL) +
        real(L)*imag(bL)) + (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bL)) 
       - real(L)*real(bL)))*(imag(L)*real(theta DOT) + real(L)*imag(theta DOT)) - ((real(m)*(imag(r)^2))
       - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) - real(r)^2 + real(r)
       (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bL) - 2*imag(r)*real(m)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))
       real(L)*real(bL)))*(imag(L)*imag(theta DOT) - real(L)*real(theta DOT)) + ((imag(m)*(imag(r)^2 L)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL)))*(imag(bL))*(imag(bL)))*(imag(bL))*(imag(bL)))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL))*(imag(bL
       - real(r)^2 - 2*imag(r)*real(m)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) +
       (real(m)*(imag(r)^2 - real(r)^2) + 2*imag(m)*imag(r)*real(r))*(imag(L)*imag(bR) - real(m)*(imag(r)^2 - real(r)^2)
       \label{eq:real_loss} real(L)*real(bR)))*(imag(L)*real(theta_DOT) + real(L)*imag(theta_DOT)) - ((real(m)*(imag(r)^2 - (label{eq:loss}))))*(imag(L)*real(label{eq:loss}))
       - real(r)^2 + 2*imag(m)*imag(r)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) -
       (imag(m)*(imag(r)^2 - real(r)^2) - 2*imag(r)*real(m)*real(r))*(imag(L)*imag(bR) - 2*imag(m)*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(imag(m))*(i
       real(L)*real(bR)))*(imag(L)*imag(theta DOT) - real(L)*real(theta DOT)) + ((imag(m wR)*(imag(r)^2 least constant consta
       - real(r)^2) - 2*imag(r)*real(m wR)*real(r))*(imag(L)*real(bL) + real(L)*imag(bL)) +
       (real(m wR)*(imag(r)^2 - real(r)^2) + 2*imag(m wR)*imag(r)*real(r))*(imag(L)*imag(bL)
       - real(L)*real(bL)))*(2*imag(L)*real(theta DOT) + 2*real(L)*imag(theta DOT)) -
       ((real(m_wR)*(imag(r)^2 - real(r)^2) + 2*imag(m_wR)*imag(r)*real(r))*(imag(L)*real(bL) + 2*imag(m_wR)*imag(r)*real(r))*(imag(L)*real(bL) + 2*imag(m_wR)*imag(r)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r)*real(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(imag(r))*(
       real(L)*imag(bL)) - (imag(m wR)*(imag(r)^2 - real(r)^2) -
       2*imag(r)*real(m wR)*real(r))*(imag(L)*imag(bL) - real(L)*real(bL)))*(2*imag(L)*imag(theta DOT)
       -2*real(L)*real(theta DOT)) + ((imag(m wL)*(imag(r)^2 - real(r)^2) -
       2*imag(r)*real(m wL)*real(r))*(imag(L)*real(bR) + real(L)*imag(bR)) +
        (real(m WL)*(imag(r)^2 - real(r)^2) + 2*imag(m WL)*imag(r)*real(r))*(imag(L)*imag(bR)
        - real(L)*real(bR)))*(2*imag(L)*real(theta DOT) + 2*real(L)*imag(theta DOT)) -
        ((real(m_wL)*(imag(r)^2 - real(r)^2) + 2*imag(m_wL)*imag(r)*real(r))*(\overline{i}mag(L)*real(bR) + 2*imag(m_wL)*(imag(r)^2) + 2*imag(
       real(L)*imag(bR)) - (imag(m_wL)*(imag(r)^2 - real(r)^2) -
       2*imag(r)*real(m wL)*real(r))*(imag(L)*imag(bR) - real(L)*real(bR)))*(2*imag(L)*imag(theta DOT) - real(m wL)*real(m wL)*real(r))*(imag(mag(bR))*(imag(bR))*(imag(bR))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(mag(bR)))*(imag(
       2*real(L)*real(theta_DOT)) - (2*imag(bL)*imag(v_Cx) - 2*real(bL)*real(v_Cx))*(imag(I_wR)*real(L)*real(L)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real(bL)*real
       + imag(L) *real(I wR)) - (2*imag(bL) *real(v Cx) + 2*real(bL) *imag(v Cx)) *(imag(I wR) *imag(L)
       - real(I_wR)*real(L)) + (2*imag(bR)*imag(v_Cx) - 2*real(bR)*real(v_Cx))*(imag(I_wL)*real(L)
       + imag(L) *real(I wL)) + (2*imag(bR) *real(v Cx) + 2*real(bR) *imag(v Cx)) * (imag(I wL) *imag(L) -
       real(I wL)*real(L)) - (imag(theta DOT)*real(v Cx) +
       imag(v_Cx)*real(theta_DOT))*((imag(m_wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(v_Cx)*real(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(v_Cx)*real(r)^4 + real(r)^4 - 6*imag(r)^4 + real(r)^4 + real
       real (m \text{ wL}) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(d)*real(m) + real(d)*imag(m)) +
       (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
       -4*imag(r)^3*real(r))*(imag(d)*imag(m) - real(d)*real(m))) + (imag(theta DOT)*imag(v Cx)
       - real(theta DOT)*real(v Cx))*((imag(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) +
       real(m WL)*(4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r)))*(imag(d)*imag(m) - real(d)*real(m)) - real(d)*real(m) - real(m) - re
       (real(m wL)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wL)*(4*imag(r)*real(r)^3)
       -4*imag(r)^3*real(r)))*(imag(d)*real(m) + real(d)*imag(m))) - (imag(theta_DOT)*real(v_Cx))
       + imag(v_Cx)*real(theta_DOT))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + imag(v_Cx)*real(theta_DOT))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + imag(v_Cx)*real(theta_DOT))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)) + imag(v_Cx)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(r)^4 + real(r)^4) + 6*imag(r)^4 + real(r)^4 + r
        (\text{real}(\text{m\_wR}) * (\text{imag}(\text{r}) ^4 + \text{real}(\text{r}) ^4 - 6* \text{imag}(\text{r}) ^2* \text{real}(\text{r}) ^2) - \text{imag}(\text{m\_wR}) * (4* \text{imag}(\text{r}) * \text{real}(\text{r}) ^3) 
       -4*imag(r)^3*real(r))*(imag(d)*imag(m) - real(d)*real(m))) + (imag(theta DOT)*imag(v Cx)
       - real(theta_DOT)*real(v_Cx))*((imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (mag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(m_wR)*(imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) + (imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2)) + (imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(imag(m_wR)*(
       real (m_wR) * (4*imag(r)*real(r)^3 - 4*imag(r)^3*real(r))) * (imag(d)*imag(m) - real(d)*real(m)) - real(m) * (m_wR) * 
       (real(m wR)*(imag(r)^4 + real(r)^4 - 6*imag(r)^2*real(r)^2) - imag(m wR)*(4*imag(r)*real(r)^3 - imag(m wR)*(4*imag(r)*real(r)^3 - imag(m wR)*(4*imag(r)*real(r)^3)
      4*imag(r)^3*real(r)))*(imag(d)*real(m) + real(d)*imag(m)))). To include parameters and conditions
       in the solution, specify the 'ReturnConditions' value as 'true'.
S = struct with fields:
```

v_Cx_DOT: [2×1 sym]
theta_DOT_DOT: [2×1 sym]