## A Solution to the Three-bar-linkage Mechanism Problem Based on MATLAB

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## I. Introduction

This project is aimed at solving a three-bar-linkage problem. In the problem, there are three bars connected head to tail one after another. The bar lengths and their initial positions are given. At then, link L1 started to rotate with an angular acceleration of 3 rad/s<sup>2</sup>. We are then asked to find the angular velocities and angular accelerations of the three links and sketch the diagram of them with the help of our computers.

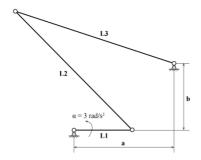


Figure 1 Diagram of the problem

## **II. Solutions**

# A. Link L1(solutions: $\omega_1 = (3t) \, rad/s^2$ , $\alpha_1 = 3 \, rad/s^2$ )

To solve this problem, I came out with the idea of relative-motion analysis in chapter 16.

$$\omega_1 = \alpha_1 \cdot t \quad \Rightarrow \quad \omega_1 = (3t) \text{ rad/s}^2$$
 (A-1)

$$V_A = V_O + \omega_1 \times r_{A/O} = \omega_1 \times r_{A/O} \Rightarrow V_A = V_A(t)$$
 (A-2)

Then, to find  $r_{A/O}$ , I set up an coordinate system with the origin point at O and calculated the coordinates of A,  $(0.35\cos\theta, 0.35\sin\theta)$ , in which  $\theta = 1/2 \cdot \omega_1^2$ .

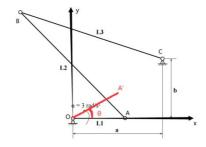


Figure 2 Set up an coordinate system

### B. Link L2

After I've gotten all the information of point A(coordinates, angular velocity, linear velocity, angular acceleration), it's time to move on to solve the next point. Similarly, relative-motion analysis is applied.

$$V_B = V_A + \omega_2 \times r_{B/A} \Rightarrow V_B = V_B(t, \omega_2)$$
 (B-1)

But before that, we have to calculate the coordinates of point B. I assumed the coordinates to be (x,y), and calculated the explicit expression with the equation AB=BC=1m.

$$AB = AC = 1m \Rightarrow x = x(t), y = y(t)$$
 (B – 2)

Here we need to pay attention to the solutions. Since it is binary quadratic equations, it can provide two roots. Explicit explanation is that we used the distance relation to find the coordinates of B, there exists two of them, and what we need to do is to choose the one with smaller x and larger y.

$$x = min(solutions(x)), y = max(solutions(y))$$
 (B – 3)

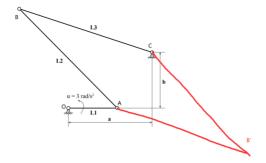


Figure 3 Two solutions of B(x,y)

### C. Link L3

For link L3, I tried to solve it in an opposite direction.(i.e try to express the attributes of point B with symbols of point C).

$$V_B = V_C + \omega_3 \times r_{B/C} = \omega_3 \times r_{B/C} \Rightarrow V_B = V_B(t, \omega_3)$$
 (C-1)

Finally I equals two expressions of  $V_B$  and and solved these sets of equations with the help of MATLAB:

$$\begin{cases} V_{Bx}(t, \omega_2) = V_{Bx}(t, \omega_3) \\ V_{By}(t, \omega_2) = V_{By}(t, \omega_3) \end{cases} \Rightarrow \begin{cases} \omega_2 = \omega_2(t) \\ \omega_3 = \omega_3(t) \end{cases}$$
 (C-2)

As for the angular acceleration, a simple differentiating procedure is used.

$$\begin{cases} \alpha_1 = \frac{d(\omega_1)}{dt} = \alpha_1(t) \\ \alpha_2 = \frac{d(\omega_2)}{dt} = \alpha_2(t) \\ \alpha_3 = \frac{d(\omega_3)}{dt} = \alpha_3(t) \end{cases}$$
 (C-3)

## III. Results

I draw the diagrams of the angular velocities and angular accelerations of the three bars separately, which are shown below.

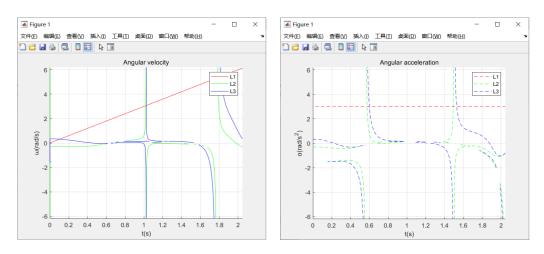


Figure 4 Angular velocity and angular acceleration of three bars

#### IV. Discussion

The diagram above may not be correct since there are isolated dashed lines there. But I cannot tell you whether or not it is wrong. I have to admire the strong calculating ability of computer, without it, I cannot even generate a single solution.

## V. Appendix

### A. Code

```
% Author Yuchen Song
 % 2021-6-23 10:26
clc;clear;
 syms t x y o2 o3; 11=0.35; 12=1; 13=1;
 tmax = sqrt(4*pi/3); o1 = 3*t;
omega1 = [0, 0, 01]; omega2 = [0, 0, 02]; omega3 = [0, 0, 03]; theta = 1.5 \pm t \pm t;
 A = [11*\cos(theta), 11*\sin(theta), 0];
 roa = A-0;
 vA = cross(omega1, rOA);
B = [x, y, 0];
C = [0.6, 0.4, 0];
y = (0.17+(0.7*\cos(\text{theta})-1.2)*x)/(0.8-0.7*\sin(\text{theta}));
x = solve(0.36+x*x-1.2*x+0.16+y*y-0.8*y==1);
 x = x(2);
 rAB = B-A; rBC = C-B;
 vB1 = vA + cross(omega2, rAB);
 vB2 = cross(omega3, rBC);
 eqns2 = [vB1(1) == vB2(1), vB1(2) == vB2(2)];
 vars2 = [o2, o3];
[02, 03] = solve(eqns2, vars2);
alpha1 = 3+0*t; alpha2 = diff(o2, t); alpha3 = diff(o3, t);
alpha2 = subs(alpha2); alpha3 = subs(alpha3);
 o2 = subs(o2); o3 = subs(o3);
 %plotting
hold;
 grid on;
 span = [0,tmax];
 po1 = ezplot(o1, span);
 set(po1, 'Color', 'r');
 po2 = ezplot(o2, span);
 set(po2,'Color','g');
 po3 = ezplot(o3, span);
 set(po3, 'Color', 'b');
 pa1 = ezplot(alpha1, span);
 set(pa1,'linestyle','--','Color','r');
 pa2 = ezplot(alpha2, span);
 set(pa2, 'linestyle', '--', 'Color', 'g');
 pa3 = ezplot(alpha3, span);
set(pa3, 'linestyle','--','Color','b');
title('Angular velocity & acceleration');
 xlabel('t(s)');
 ylabel('\omega(rad/s) or \alpha(rad/s^2)');
 legend('L1ω', 'L2ω', 'L3ω', 'L1α', 'L2α', 'L3α');
```

## B. Variables

B. Varu	
variables	value
$\omega_1(t)$	3*t
$\omega_2(t)$	$(21^{\circ}t^{\circ}(6^{\circ}tan((3^{\circ}t^{\circ}2)/4) + 2^{\circ}tan((3^{\circ}t^{\circ}2)/4)^{\circ}2 \cdot (5^{\circ}(x^{\circ}((7^{\circ}cos((3^{\circ}t^{\circ}2)/2)/10 - 6^{\circ}5) + 17/100))/((7^{\circ}sin((3^{\circ}t^{\circ}2)/2)/10 - 4^{\circ}5) \cdot (tan((3^{\circ}t^{\circ}2)/4)^{\circ}(105^{\circ}cos((3^{\circ}t^{\circ}2)/2) - 336^{\circ}sin((3^{\circ}t^{\circ}2)/2) + 294^{\circ}sin((3^{\circ}t^{\circ}2)/2)^{\circ}2 + 40^{\circ}((4116^{\circ}sin((3^{\circ}t^{\circ}2)/2)/2)/25 - (6328^{\circ}sin((3^{\circ}t^{\circ}2)/2))/25 - (9492^{\circ}cos((3^{\circ}t^{\circ}2)/2)/25 - (2352^{\circ}cos((3^{\circ}t^{\circ}2)/2)/25 + (3136^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + (3136^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + 13231/25)/(1/2) - 196^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 - (6328^{\circ}sin((3^{\circ}t^{\circ}2)/2)/2)/25 - (9492^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 - (2352^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + 49^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + (3136^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + 13231/25)/(1/2) - 196^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + (3136^{\circ}cos((3^{\circ}t^{\circ}2)/2)/2)/25 + (313$
$\omega_3(t)$	$-(105^{\circ}t^{\circ}((x^{\circ}((7^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/10 - 6/5) + 17/100)/((7^{\circ}\sin((3^{\circ}t^{\wedge}2)/2))/10 - 4/5) + (\tan((3^{\circ}t^{\wedge}2)/4)^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) - 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) + 294^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)/25 + (949^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 - (949^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 - (949^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)/25 + 13231/25)/(1/2) - 35^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)^{\wedge}2/25 - (6328^{\circ}\sin((3^{\circ}t^{\wedge}2)/2))/25 - (949^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 - (2352^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)/25 + (3136^{\circ}\cos((3$
$\alpha_1(t)$	3
$\alpha_2(t)$	$(21*(6*tan((3*t^2)/4) + 2*tan((3*t^2)/4)^2 - (5*(x*((7*cos((3*t^2)/2)/10 - 6/5) + 17/100))/((7*sin((3*t^2)/2))/10 - 4/5) - (tan((3*t^2)/4)*(105*cos((3*t^2)/2) - 336*sin((3*t^2)/2) + 294*sin((3*t^2)/2)^2 + 40*((4116*sin((3*t^2)/2)^2)/25 - (6328*sin((3*t^2)/2))/25 - (9492*cos((3*t^2)/2))/25 - (2352*cos((3*t^2)/2))/25 - (2352*cos((3*t^2)/2))/25 + (3136*cos((3*t^2)/2))/25 + 13231/25)/(1/2) - 35*sin((3*t^2)/2)^2 + (116*sin((3*t^2)/2)^2)/25 - (6328*sin((3*t^2)/2))/25 - (9492*cos((3*t^2)/2))/25 - (2352*cos((3*t^2)/2))/25 - (2352*cos((3*t^2)/2))/25 + (3136*cos((3*t^2)/2))/25 + 13231/25)/(1/2) - 196*cos((3*t^2)/2))/10 - (6/5) + 17/100)/((7*sin((3*t^2)/2))/20 - (4/5) - 2)/(4^*sin((3*t^2)/2))/20 - (4/5) - (4/5$

 $13231/25)^{\circ}(1/2) \ - \ 35^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 \ - \ (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 \ - \ (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 \ - \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2 \ + \ (2352^{\circ}\cos((3^{$  $(3136 * \cos((3*t^22)/2)^2)/25 + 13231/25)^4(1/2) - 196 * \cos((3*t^22)/2) * \sin((3*t^22)/2) + 204))/(49 * \sin((3*t^22)/2)^2 - 112 * \sin((3*t^22)/2) - 168 * \cos((3*t^22)/2) + 49 * \cos((3*t^22)/2)^2 + 1231/25)/2 + 1231/25/25$  $208) \ -\ 14) \ +\ (21^*t^*(9^*t^*(\tan((3^*t^2)/4)^2 \ +\ 1) \ +\ 6^*t^*\tan(((3^*t^2)/4)^*(\tan((3^*t^2)/4)^2 \ +\ 1) \ -\ (3^*t^*(\tan((3^*t^2)/4)^2 \ +\ 1)^*(105^*\cos((3^*t^2)/2) \ -\ 336^*\sin(((3^*t^2)/2)) \ +\ 1)^*(105^*\cos((3^*t^2)/2)) \ -\ 336^*\sin((3^*t^2)/2) \ +\ 1)^*(105^*\cos((3^*t^2)/2)) \ -\ 336^*\sin((3^*t^2)/2) \ +\ 1)^*(105^*\cos((3^*t^2)/2)) \ -\ 336^*\sin((3^*t^2)/2)) \ +\ 1)^*(105^*\cos((3^*t^2)/2)) \ +\ 1)^*(105^*\cos((3^*t^2)/$  $294*\sin((3*t^2)/2)^2 + 40*((4116*\sin((3*t^2)/2)^2)/25 - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2$  $+ \ 13231/25)^{\circ}(1/2) \ - \ 35^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 \ - \ (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 \ - \ (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 \ - \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25)/25 \ + \ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25)/25 \ + \ (235$  $(3136*\cos((3*t^22)/2)^2)/25 + 13231/25)^4(1/2) - 196*\cos((3*t^2)/2)^2 \sin((3*t^2)/2) + 204))/(2*(49*\sin((3*t^2)/2)^2 - 112*\sin((3*t^2)/2) - 168*\cos((3*t^2)/2) + 49*\cos((3*t^2)/2)^2 + 112^2\sin((3*t^2)/2) + 112^2\sin((3*t^2)/$  $208)) \ + \ (15*t*tan((3*t^2)/4)*(tan((3*t^2)/4)^2 \ + \ 1)*(x*((7*cos((3*t^2)/2))/10 \ - \ 6/5) \ + \ 17/100))/((7*sin((3*t^2)/2))/10 \ - \ 4/5)))/(42*tan((3*t^2)/4) \ + \ 14*tan((3*t^2)/4)^2 \ + \$  $(25*(x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) + (4*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)^2 + 40*((4116*\sin((3*t^2)/2)^2)/2) - 36*\sin((3*t^2)/2) + (4*(105*\cos((3*t^2)/2)/2) + (4*(105*\cos($  $(6328*\sin((3*t^22)/2))/25 \quad - \quad (9492*\cos((3*t^22)/2))/25 \quad - \quad (2352*\cos((3*t^22)/2)*\sin((3*t^22)/2))/25 \quad + \quad (3136*\cos((3*t^22)/2)^2/25 \quad + \quad 13231/25)^4(1/2) \quad - \quad (2352*\cos((3*t^22)/2))/25 \quad + \quad (3136*\cos((3*t^22)/2))/25 \quad + \quad (3166*\cos((3*t^22)/2))/25 \quad$  $35 * \sin((3*t^2)/2)*((4116*\sin((3*t^2)/2)^2/2)25 - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2))^2)\sin((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2)^2/2)/25 + (316*\cos((3*t^2)/2)^2/2)/25 +$  $13231/25)^{\wedge}(1/2) \quad - \quad 196^{\circ}\cos((3^{\circ}(^{\wedge}2)/2)^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 204))/(49^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 \quad - \quad 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad - \quad 168^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 49^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 \quad + \quad 208) \quad - \quad 108^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 108^{\circ}\cos((3^{\circ}t^{\wedge$  $(7^*\tan((3^*t^2)/4)^*(105^*\cos((3^*t^2)/2) - 336^*\sin((3^*t^2)/2) + 294^*\sin((3^*t^2)/2)^2 + 40^*((4116^*\sin((3^*t^2)/2)^2)/25 - (6328^*\sin((3^*t^2)/2))/25 - (9492^*\cos((3^*t^2)/2))/25 - (9492^*\cos$  $(2352*\cos((3*t^2)/2)*\sin((3*t^2)/2))*(316*\cos((3*t^2)/2)/2)/25 \ + \ (3136*\cos((3*t^2)/2)/2)/25 \ + \ (3136*\cos((3*t^2)/2)/2)/25 \ - \ (6328*\sin((3*t^2)/2)/2)/25 \ - \ (6328*\cos((3*t^2)/2)/2)/25 \ (9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2)* \sin((3*t^2)/2) + (3136 * \cos((3*t^2)/2)/25 + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 2041)/(49 * \sin((3*t^2)/2)^* (1/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 13231/25)^* (1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) * \cos((3*t^2)/2) * \cos((3*$  $-112*\sin((3*t^2)/2) - 168*\cos((3*t^2)/2) + 49*\cos((3*t^2)/2)/2 + 208) + (95*\tan((3*t^2)/4)/2*(x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) + (12*\sin((3*t^2)/2)/2)/2 + (12*\cos((3*t^2)/2)/2)/2 + (12*\cos((3*t^2)/2$  $(4*\tan((3*t^2)/4)^2*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)^2 + 40*((4116*\sin((3*t^2)/2)/2) - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (9492*\cos((3*t^$  $(2352*\cos((3*t^22)/2)*\sin((3*t^22)/2))/25 \ + \ (3136*\cos((3*t^22)/2)/2)/25 \ + \ (3136*\cos((3*t^22)/2)/2)/25 \ - \ (6328*\sin((3*t^22)/2)/2)/25 \ - \ (6328*\sin((3*t^22)$  $(9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + 13231/25)/(1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 204))/(49 * \sin((3*t^2)/2)/2)/2 + (3136 * \cos((3*t^2)/2)/2)/25 + (313$  $-112^*\sin((3^*t^2)/2) - 168^*\cos((3^*t^2)/2) + 49^*\cos((3^*t^2)/2) + 208) - 14) - (21^*t^*(63^*t^*(\tan((3^*t^2)/4)/2 + 1) + 42^*t^*\tan((3^*t^2)/4)^*(\tan((3^*t^2)/4)/2 + 1) - (21^*t^*(63^*t^*(\tan((3^*t^2)/4)/2 + 1) + 42^*t^*\tan((3^*t^2)/4))) - (21^*t^*(a^*t^2)/4)) - (21^*t^*(a^*t^2)/4) - (21^*$  $(21*i*(\tan((3*t^2)/4)^2 + 1)*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)^2 + 40*((4116*\sin((3*t^2)/2)^2)/25 - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25)$  $- (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2)) * (3136 * \cos((3*t^2)/2) * (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2)) * (4116 * \sin((3*t^2)/2) * (2352 * \cos((3*t^2)/2) * \cos((3*t^2)/2) * (2352 * \cos((3*t^2)/2) * (235$  $(9492*\cos((3*t^2)/2))/25 \quad - \quad (2352*\cos((3*t^2)/2)*\sin((3*t^2)/2))/25 \quad + \quad (3136*\cos((3*t^2)/2)/2)/25 \quad + \quad 13231/25)/(1/2) \quad - \quad 196*\cos((3*t^2)/2)*\sin((3*t^2)/2) \quad + \quad (3136*\cos((3*t^2)/2)/2)/25 \quad + \quad (3136*\cos((3*t^2)/2)/25 \quad + \quad (3136*\cos((3*t^2)/2)/2)/25 \quad + \quad (3136*\cos((3*t^2)/2)/25 \quad + \quad (3136*\cos((3*t^2)/2)/25 \quad + \quad (3136*\cos((3*t^2)/2)/2)/25 \quad + \quad (3$  $204))/(2*(49*\sin((3*t^2)/2)^2 - 112*\sin((3*t^2)/2) - 168*\cos((3*t^2)/2) + 49*\cos((3*t^2)/2)^2 + 208)) + (285*t^3\tan((3*t^2)/4)^3(\tan((3*t^2)/4)^2 + 1)^3(x^3((7*\cos((3*t^2)/2))/10 - 10x^3)^3(x^3(x^3)/2)) + (285*t^3\tan((3*t^2)/2)^3(x^3(x^3)/2) + (285*t^3\tan((3*t^2)/2)^3(x^3(x^3)/2)) + (285*t^3\tan((3*t^2)/2)^3(x^3(x^3)/2) + (2$  $6/5) \ + \ 17/100))'((7*\sin((3*t^2)/2))'10 \ - \ 4/5) \ + \ (12*t^*\tan((3*t^2)/4)*(\tan((3*t^2)/4)^2 \ + \ 1)*(105*\cos((3*t^2)/2) \ - \ 336*\sin((3*t^2)/2) \ + \ 294*\sin((3*t^2)/2)^2 \ + \ 4/5)$  $40^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/2) - (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 - (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 - (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2))^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/2) + (313$  $35 * \sin((3*t^2)/2) * ((4116 * \sin((3*t^2)/2)/2) * (6328 * \sin((3*t^2)/2))/25 - (6328 * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + (3136 * \cos((3*t^2)/$  $13231/25)^{\wedge}(1/2) - 196^{*}\cos((3^{*}t^{\wedge}2)/2)^{*}\sin((3^{*}t^{\wedge}2)/2) + 204))/(49^{*}\sin((3^{*}t^{\wedge}2)/2)^{\wedge}2 - 112^{*}\sin((3^{*}t^{\wedge}2)/2) - 168^{*}\cos((3^{*}t^{\wedge}2)/2) + 49^{*}\cos((3^{*}t^{\wedge}2)/2)^{\wedge}2 + 208))^{*}(6^{*}\tan((3^{*}t^{\wedge}2)/2) + 208)$  $2*tan((3*t^2)/4)/2 - (5*(x*((7*cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*sin((3*t^2)/2))/10 - 4/5) - (tan((3*t^2)/4)*(105*cos((3*t^2)/2) - 336*sin((3*t^2)/2) + 294*sin((3*t^2)/2)/2 + 294*sin((3*t^2)/2)/2)/2 + (1.5*tos((3*t^2)/2) + 2.5*tos((3*t^2)/2)/2)/2 + (1.5*tos((3*t^2)/2)/2)/2 + (1.5*tos($  $40^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 - (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 - (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 - (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 + (3136^{\circ}\cos((3^$  $35 * \sin((3*t^2)/2)*((4116*\sin((3*t^2)/2)/2)^2) + (6328 * \sin((3*t^2)/2))/25 - (6328 * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + (3136 * \cos((3*t^2)/2$  $13231/25)^{\circ}(1/2) - 196^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2) + 204))(49^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 112^{\circ}\sin((3^{\circ}t^{\circ}2)/2) - 168^{\circ}\cos((3^{\circ}t^{\circ}2)/2) + 49^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2 + 208) + 100^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2 + 100^{\circ}3 + 100^{\circ}3 + 100^{\circ}3 + 100^{\circ}3 + 100^{\circ}3 + 100$  $(5*\tan((3*t^2)/4)^2*(x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) - 2))/(42*\tan((3*t^2)/4) + 14*\tan((3*t^2)/4)^2 + (25*x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) - 2))/(42*\tan((3*t^2)/4) + 14*\tan((3*t^2)/4)^2 + (25*x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) - 2))/(42*\tan((3*t^2)/4) + 14*\tan((3*t^2)/4)^2 + (25*x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) - 2))/(42*\tan((3*t^2)/4) + 14*\tan((3*t^2)/4)^2 + (25*x*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 6/5) + 17/100)/((7*\sin((3*t^2)/2))/10 - 6/5) + 17/100)/((7*\sin((3*t^2)/2))/10 - 6/5) + 17/100)/((7*\sin((3*t^2)/2))/((7*\sin((3*$  $17/4)/((7*\sin((3*t^2)/2))/10 - 4/5) + (420*\cos((3*t^2)/2) - 1344*\sin((3*t^2)/2) + 1176*\sin((3*t^2)/2)^2 + 160*((3136*\cos((3*t^2)/2)^2)/25 - (2352*\cos((3*t^2)/2)^2)\sin((3*t^2)/2)/25) + (2352*\cos((3*t^2)/2)^2) + (2$  $(9492 * \cos((3*t^2)/2))/25 \quad + \quad (4116 * \sin((3*t^2)/2)/2)/25 \quad - \quad (6328 * \sin((3*t^2)/2))/25 \quad + \quad 13231/25)/(1/2) \quad - \quad 140 * \sin((3*t^2)/2)*((3136 * \cos((3*t^2)/2)/2)/25 \quad - \quad (6328 * \sin((3*t^2)/2))/25 \quad + \quad (116 * \sin((3*t^2)/2)/2)/2)/25 \quad - \quad (116 * \sin((3*t^2)/2)/2)/25 \quad - \quad (116 * \sin((3*t^2)/2)/2)/2)/25 \quad - \quad (116 * \sin((3*t^2)/2)/2)/25 \quad - \quad (116 * \sin((3*t^2)/2)/2)/2)/25 \quad - \quad (116 * \sin((3*t^2)/2)/2)/2)/2 \quad - \quad (116 * \sin((3*t^2)/2)/2)/2 \quad - \quad (116 * \sin((3*t^2)/2)/2)/2)/2 \quad - \quad (116 * \cos((3*t^2)/2)/2)/2 \quad -$  $(2352*\cos((3*t^2)/2)*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 + (4116*\sin((3*t^2)/2)/2)/25 - (6328*\sin((3*t^2)/2))/25 + 13231/25)^*(1/2) - 784*\cos((3*t^2)/2)^*\sin((3*t^2)/2) + 13231/25)^*(1/2) - 13231/25)$  $816)/(49 * \cos((3*t^2)/2)/2 - 168 * \cos((3*t^2)/2)/2 + 49 * \sin((3*t^2)/2)/2 - 112 * \sin((3*t^2)/2) + 208) - (7* \tan((3*t^2)/4) * (105 * \cos((3*t^2)/2) - 336 * \sin((3*t^2)/2) + 208) - (7* \tan((3*t^2)/4) * (105 * \cos((3*t^2)/2)/2) - 336 * \sin((3*t^2)/2)/2) + (105 * \cos((3*t^2)/2)/2) + (105 *$  $294*\sin((3^*t^2)/2)/2 + 40*((3136*\cos((3^*t^2)/2)/2)/25 - (2352*\cos((3^*t^2)/2))/25 - (9492*\cos((3^*t^2)/2))/25 - (4116*\sin((3^*t^2)/2)/2)/25 - (6328*\sin((3^*t^2)/2))/25 - (6328*\sin((3^*t^2)/2)/2)/25 - (6328*\cos((3^*t^2)/2)/2)/25 - (6328*\cos((3^*t^2)/2)/20 - (6328*\cos((3^*t^2)/2)/2)/20 - (6328*\cos((3^*t^2)/2)/2)/20 - (6328*\cos((3^*t^2)/2)/20 - (6328*\cos((3^*t^2)/2)/2)/20 - (6328*\cos((3^*t^2)/2)/20 - (6328*\cos((3^*t^2)/2)/20 - (6328*\cos((3^*t^2)/2)/$  $+\ 13231/25)^{\circ}(1/2)\ -\ 35^{*}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25\ -\ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25\ -\ (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25\ +\ (4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25\ -\ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25\ -\ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25\ -\ (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/25\ -\ (2352$  $(6328*\sin((3*t^22)/2))/25 + 13231/25)^*(1/2) - 196*\cos((3*t^22)/2)*\sin((3*t^22)/2) + 204))/(49*\cos((3*t^22)/2)^2 - 168*\cos((3*t^22)/2) + 49*\sin((3*t^22)/2)^2 - 112*\sin((3*t^22)/2) + 208)$  $+ \quad (95^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(x^{\circ}((7^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/10 \quad - \quad 6/5) \quad + \quad 17/100))/((7^{\circ}\sin(((3^{\circ}t^{\wedge}2)/2))/10 \quad - \quad 4/5) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad - \quad 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad - \quad 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad - \quad 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad - \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad - \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/4)^{\vee}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/4)^{\vee}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/4)^{\vee}2^{\circ}(105^{\circ}\cos((3^{\circ}t^$  $294*\sin((3*t^2)/2)^2 + 40*((3136*\cos((3*t^2)/2)^2)/2) - (2352*\cos((3*t^2)/2)/2) + \sin((3*t^2)/2)/2) - (9492*\cos((3*t^2)/2)/2) + (4116*\sin((3*t^2)/2)/2)/2) - (6328*\sin((3*t^2)/2)/2)/2) + (6328*\sin((3*t^2)/2)/2) + (6328*\sin((3*t^2)/2)/2)/2) + (6328*\cos((3*t^2)/2)/2)/2) + (6328*\cos((3*t^2)/2)/2) + (6328*\cos((3*t^2)/2)/2)/2) + (6328*\cos((3*t^2)/2)/2) + (6328*\cos((3*t^2)/2)$  $+ \ 13231/25)^{\circ}(1/2) \ - \ 35 * \sin((3*t^2)/2)*((3136 * \cos((3*t^2)/2)^2)/25 \ - \ (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 \ - \ (9492 * \cos((3*t^2)/2))/25 \ + \ (4116 * \sin((3*t^2)/2)^2)/25 \ - \ (2352 * \cos((3*t^2)/2))/25 \ - \ (2352 * \cos((3*t^2)/2))/25$  $(6328*\sin((3*t^22)/2))/25 + 13231/25)^*(1/2) - 196*\cos((3*t^22)/2)*\sin((3*t^22)/2) + 204))/(49*\cos((3*t^22)/2)^2 - 168*\cos((3*t^22)/2) + 49*\sin((3*t^22)/2)^2 - 112*\sin((3*t^22)/2) + 204) - 112*\sin((3*t^22)/2) + 204)$ 14)^2

#### $\alpha_3(t)$

 $(105^{\circ}\text{t}^{\circ}((x^{\circ}((x^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/10 - 6/5) + 17/100)/((7^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/10 - 4/5) + (\tan((3^{\circ}\text{t}^{\wedge}2)/4)^{\circ}(105^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2) - 336^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2) + 294^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)^{\wedge}25 + 40^{\circ}((4116^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 - (6328^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 - (9492^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 - (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + 13231/25)^{\wedge}(12) - 35^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)^{\circ})/25 - (6328^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2))/25 - (9492^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 - (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)^{\circ})/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (3136^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2))/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (328^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (328^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (2352^{\circ}\text{cos}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (326^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (326^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (326^{\circ}\text{sin}((3^{\circ}\text{t}^{\wedge}2)/2)/25 + (326^{\circ}\text{sin}((3^{$ 

 $140^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2)/2) - (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 - (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 + (4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 - (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 - (116^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (116^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 - (116^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (116^{\circ}\sin((3^{\circ}t^{\circ}2)/2$  $13231/25)^{\wedge}(1/2) \quad - \quad 784^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 816)^{\prime}(49^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 \quad - \quad 168^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 49^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 \quad - \quad 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 208) \quad - \quad 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \quad + \quad 112^{\circ}\sin((3^{\circ}t^$  $(9492*\cos((3*(^2)/2))/25 \quad + \quad (4116*\sin((3*(^2)/2)/2)/2)/25 \quad - \quad (6328*\sin((3*(^2)/2)/2)/25 \quad + \quad 13231/25)(1/2) \quad - \quad 35*\sin((3*(^2)/2)/2)(3136*\cos((3*(^2)/2)/2)/2) \quad - \quad (6328*\sin((3*(^2)/2)/2)/2)/25 \quad - \quad (6328*\sin((3*(^2)/2)/2)/2)/25 \quad + \quad (4116*\sin((3*(^2)/2)/2)/2)/2)/2 \quad + \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (6328*\sin((3*(^2)/2)/2)/2)/2 \quad + \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (6328*\sin((3*(^2)/2)/2)/2)/2 \quad + \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (4116*\sin((3*(^2)/2)/2)/2)/2 \quad - \quad (41$  $(2352*\cos((3*(^2)/2)*\sin((3*(^2)/2))/25 - (9492*\cos((3*(^2)/2))/25 + (4116*\sin((3*(^2)/2)/2)/25 - (6328*\sin((3*(^2)/2))/25 + 13231/25)^*(1/2) - 196*\cos((3*(^2)/2)/2)\sin((3*(^2)/2)/2) + (116*\sin((3*(^2)/2)/2)/25 - (6328*\sin((3*(^2)/2)/2)/25 + 13231/25)^*(1/2) - 196*\cos((3*(^2)/2)/2)/25 + (116*\sin((3*(^2)/2)/2)/2) + (116*\sin((3*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/2)/2)/25 + (116*(^2)/2)/25 + (116*(^2)/2)/2)/25 + (116*(^2)/2)/25 + (116*$  $204))/(49*\cos((3*t^2)/2)^2 - 168*\cos((3*t^2)/2) + 49*\sin((3*t^2)/2)^2 - 112*\sin((3*t^2)/2) + 208) + (95*\tan((3*t^2)/4)^2*(x*((7\cos((3*t^2)/2))/10 - 6/5) + (95*\tan((3*t^2)/4)^2)^2)$  $17/100) / ((7 \sin((3*t^42)/2))' 10 - 4/5) + (4*\tan((3*t^42)/4)^2 * (105*\cos((3*t^2)/2) - 336*\sin((3*t^42)/2) + 294*\sin((3*t^2)/2)^2 + 40*((3136*\cos((3*t^42)/2)^2)/2) - 336*\sin((3*t^42)/2) + 294*\sin((3*t^42)/2)^2 + 40*((3136*\cos((3*t^42)/2)^2) + (3136*\cos((3*t^42)/2)^2) + (316*\cos((3*t^42)/2)^2) + (316*\cos((3*t^42)/2)^2) + (316*\cos((3*t^42)/2)^2) + (316*\cos((3*t^42)/2)^2$  $(2352*\cos((3*t^22)/2)*\sin((3*t^22)/2))/25 \quad - \quad (9492*\cos((3*t^22)/2))/25 \quad + \quad (4116*\sin((3*t^22)/2)/2/25 \quad - \quad (6328*\sin((3*t^22)/2))/25 \quad + \quad 13231/25)^*(1/2) \quad - \quad (2352*\cos((3*t^22)/2))/25 \quad + \quad (4116*\sin((3*t^22)/2)/2/2)/25 \quad - \quad (4116*\cos((3*t^22)/2)/2/2)/25 \quad - \quad (4116*\cos((3*t^22)/2)/2)/25 \quad - \quad (4$  $35 * \sin((3*t^2)/2)*((3136 * \cos((3*t^2)/2)^2)/2) - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2))/25 + (4116 * \sin((3*t^2)/2)^2)/25 - (6328 * \sin((3*t^2)/2))/25 + (116 * \sin((3*t^2)/2)^2)/25 - (116 * \cos((3*t^2)/2)^2)/25 - (116 * \cos((3*t^2)/2)^2)/$  $13231/25)^{\circ}(1/2) - 196^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2) + 204))/(49^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 168^{\circ}\cos((3^{\circ}t^{\circ}2)/2) + 49^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 112^{\circ}\sin((3^{\circ}t^{\circ}2)/2) + 208) - 14)^{\circ}2 - 112^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 112^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 112^{\circ}\sin((3^{$  $(105*t^*((3*t^*(\tan((3*t^2)/4)^2 \ + \ 1)^*(105*\cos((3*t^2)/2) \ - \ 336*\sin((3*t^2)/2) \ + \ 294*\sin((3*t^2)/2)^2 \ + \ 40*((4116*\sin((3*t^2)/2)^2)/25 \ - \ (6328*\sin((3*t^2)/2))/25 \ - \ (6328*\cos((3*t^2)/2))/25 \ - \ (6328*\sin((3*t^2)/2))/25 \ - \ (6328*\cos((3*t^2)/2))/25 \ - \ (6328*\cos((3*$  $(9492 * \cos((3 * t^2 2) 2) / 25 - (2352 * \cos((3 * t^2 2) 2) * \sin((3 * t^2 2) 2) / 25 + (3136 * \cos((3 * t^2 2) 2) * 2) / 25 + (3136 * \cos((3 * t^2 2) 2) * 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos((3 * t^2 2) 2) / 25 - (352 * \cos($  $(6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2))*\sin((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3231/25)^*(1/2) - 196*\cos((3*t^2)/2)/2) + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25$  $204)/(10^{4}(49^{4}\sin((3^{4}t^{2})/2)^{2} - 112^{4}\sin((3^{4}t^{2})/2) - 168^{4}\cos((3^{4}t^{2})/2) + 49^{4}\cos((3^{4}t^{2})/2)^{2} + 208)) - (3^{4}t^{4}\tan((3^{4}t^{2})/4)^{4}(\tan((3^{4}t^{2})/4)^{2} + 1)^{4}(x^{4}(7^{4}\cos((3^{4}t^{2})/2))^{4} - 10^{4}(3^{4}t^{4}\cos((3^{4}t^{2})/2))^{4}) - (3^{4}t^{4}\sin((3^{4}t^{2})/4)^{4})^{4}(\tan((3^{4}t^{2})/4)^{4})^{4} + (3^{4}t^{4}\cos((3^{4}t^{2})/4)^{4})^{4}(\tan((3^{4}t^{2})/4))^{4}) - (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4} + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4})^{4}(\tan((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}(\tan((3^{4}t^{2})/4))^{4})^{4}(\tan((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}(\tan((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}(\tan((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}(\tan((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4))^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4)^{4}) + (3^{4}t^{4}\cos((3^{4}t^{2})/4)^{4}) + (3^{4}t^{4$  $+ \frac{17/100}{(7*\sin((3*t^2)/2))/10} - \frac{4/5}{(3*t^2)/2} + \frac{14/\tan((3*t^2)/4)}{(3*t^2)/4} + \frac{14/\tan((3*t^2)/4)/2}{(2*t^2)/4} + \frac{12/100}{(3*t^2)/2} + \frac{17/100}{(3*t^2)/2} + \frac{17/100}{(3*t$  $(4*(105*\cos((3*t^22)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2) + 40*((4116*\sin((3*t^2)/2)^2/2) - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (9$  $(2352*\cos((3*t^2)/2)*\sin((3*t^2)/2))/25 \ + \ (3136*\cos((3*t^2)/2)/2)/25 \ + \ (3136*\cos((3*t^2)/2)/2)/25 \ + \ (3136*\cos((3*t^2)/2)/2)/25 \ - \ (6328*\sin((3*t^2)/2)/2)/25 \ - \ (6328*\cos((3*t^2)/2)/2)/25 \ - \ (6328*\cos((3*t^2)/2)$  $(9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + 13231/25)/(1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 204))/(49 * \sin((3*t^2)/2)/2)/2 + (3136 * \cos((3*t^2)/2)/2)/25 + (313$  $-112*\sin((3*t^2)/2) - 168*\cos((3*t^2)/2) + 49*\cos((3*t^2)/2)/2 + 208) - (7*\tan((3*t^2)/4)*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)/2 + 294*\cos((3*t^2$  $40*((4116*\sin((3*t^2)/2)^2)^2)^2 - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2)^2)\sin((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2)^2)/25 + 13231/25)^2(1/2) - (1/2)^2 + 1/2 +$  $35 * \sin((3*t^2)/2)*((4116*\sin((3*t^2)/2)^2)/2) - (6328*\sin((3*t^2)/2)/2)/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2)/2)*\sin((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + (3136*\cos((3*t^2)/$  $13231/25)^{\circ}(1/2) - 196^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2) + 204))/(49^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2 - 112^{\circ}\sin((3^{\circ}t^{\circ}2)/2) - 168^{\circ}\cos((3^{\circ}t^{\circ}2)/2) + 49^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2 + 208) + (12^{\circ}t^{\circ}2)^{\circ}2 + (12^{\circ}t^{\circ}2$  $(95*\tan((3*t^2)/4)^2*(x^*((7*\cos((3*t^2)/2))/10 - 6/5) + 17/100))/((7*\sin((3*t^2)/2))/10 - 4/5) + (4*\tan((3*t^2)/4)^2*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)^2)$  $+40 * ((4116 * \sin((3*t^2)/2)^2)/25 - (6328 * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2))/25 - (2352 * \cos((3*t^2)/2)) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + 13231/25) * (1/2) + 1/2 * (1/2) *$  $35 * \sin((3*t^2)/2)*((4116*\sin((3*t^2)/2)^2)/25 - (6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2)^2)\sin((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2)^2)/25 + (3136*\cos((3*t^2)/2)$  $13231/25)^{\wedge}(1/2) - 196^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) + 204))/(49^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 - 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) - 168^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) + 49^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 + 208) - 14) - 140^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\circ}2 + 120^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) + 120^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\circ}2 + 120^{\circ}\cos((3^{\circ}t^{\wedge}2)/$  $(105*((x*((7*\cos((3*t^22)2))/10 - 6/5) + 17/100)/((7*\sin((3*t^2)/2))/10 - 4/5) + (\tan((3*t^2)/4)*(105*\cos((3*t^22)/2) - 336*\sin((3*t^22)/2) + 294*\sin((3*t^2)/2)/2 + 294*\sin((3*t^2)/2)/2) + (105*((3*t^2)/2)/2) + (105*((3*t^2)/2)/2)/2 +$  $40^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 - (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 - (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2))/25 - (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2))/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 + (3136^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 + (3136^{\circ}\cos((3^$  $35 * \sin((3*t^2)/2)*((4116*\sin((3*t^2)/2)/2)^2) - (6328 * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2)/2)/25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2)/2)/25 + (3136 * \cos((3*t^$  $13231/25)^{\alpha}(1/2) - 196^{\circ}\cos((3^{\circ}t^{\alpha}2)/2)^{\circ}\sin((3^{\circ}t^{\alpha}2)/2) + 204))^{\alpha}(5^{\circ}t(49)^{\circ}\sin((3^{\circ}t^{\alpha}2)/2)^{\alpha} - 112^{\circ}\sin((3^{\circ}t^{\alpha}2)/2) - 168^{\circ}\cos((3^{\circ}t^{\alpha}2)/2) + 49^{\circ}\cos((3^{\circ}t^{\alpha}2)/2)^{\alpha} + 208)) - 100^{\circ}\cos((3^{\circ}t^{\alpha}2)/2)^{\alpha} + 100^{$  $(\tan((3^*t^2)/4)^*2^*(x^*((7^*\cos((3^*t^2)/2)/10 - 6/5) + 17/100))/((7^*\sin((3^*t^2)/2)/10 - 4/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((7^*\cos((3^*t^2)/2)/10 - 6/5) + 17/100))/((7^*\sin((3^*t^2)/2)/10 - 4/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((7^*\cos((3^*t^2)/2)/10 - 6/5) + 17/100))/((7^*\sin((3^*t^2)/2)/10 - 4/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((7^*\cos((3^*t^2)/2)/10 - 6/5) + 17/100))/((7^*\sin((3^*t^2)/2)/10 - 4/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((3^*t^2)/2)/10 - 6/5) + 17/100))/((7^*\sin((3^*t^2)/2)/10 - 4/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((3^*t^2)/2)/10 - 6/5))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((3^*t^2)/2)/10 - 6/5)))/(42^*\tan((3^*t^2)/4) + 14^*\tan((3^*t^2)/4)^2 + (25^*(x^*((3^*t^2)/2)/10 - 6/5)))/(42^*(x^*((3^*t^2)/2)/10 - 6/5))/(42^*(x^*((3^*t^2)/2)/10 - 6/5))/(42^*(x^*((3^$  $17/100)/((7*\sin((3*t^2)/2))/10 - 4/5) + (4*(105*\cos((3*t^2)/2) - 336*\sin((3*t^2)/2) + 294*\sin((3*t^2)/2)/2 + 40*((4116*\sin((3*t^2)/2)^2)/25 - (6328*\sin((3*t^2)/2))/25 - (6328*\sin((3*t^2)/2)/2)/25 - (6328*\cos((3*t^2)/2)/2)/25 - (6328*\cos((3*t^2)/2)/25 - (6328*\cos((3*t^2)/2)/2)/25 - (6328*\cos((3*t^2)/2)/2)/25 -$  $(9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2)*\sin((3*t^2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/25 + 13231/25)^*(1/2) - 35*\sin((3*t^2)/2)^*((4116*\sin((3*t^2)/2)/2)/2)/25 - (3136*\cos((3*t^2)/2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/2)/25 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2)/2 + (3136*\cos((3*t^2)/2)/2)/2 + (3136*\cos($  $(6328*\sin((3*t^2)/2))/25 - (9492*\cos((3*t^2)/2))/25 - (2352*\cos((3*t^2)/2)*\sin((3*t^2)/2))/25 + (3136*\cos((3*t^2)/2)^2)/25 + 13231/25)/(1/2) - 196*\cos((3*t^2)/2)^2 \sin((3*t^2)/2) + 13231/25)/(1/2) - 196*\cos((3*t^2)/2)^2 \sin((3*t^2)/2) + 13231/25)/(1/2) - 196*\cos((3*t^2)/2) + 13231/25)/(1/2) + 13231/25$  $204))/(49^{\circ}\sin((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 - 112^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) - 168^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) + 49^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\wedge}2 + 208) - (7^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) - 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) + (105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\wedge}2) + (105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)^{\vee}2) + (105^$  $294 * \sin((3*t^2)/2) ^2 + 40 * ((4116 * \sin((3*t^2)/2)/2) ^2 - (6328 * \sin((3*t^2)/2)) /25 - (9492 * \cos((3*t^2)/2)) /25 - (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2)) /25 + (3136 * \cos((3*t^2)/2) /2) /$  $+ \quad 13231/25)^{\circ}(1/2) \quad - \quad 35^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/25 \quad - \quad (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/25 \quad - \quad (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 \quad - \quad (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/2)/25 \quad + \quad (352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/25 \quad - \quad (352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/25 \quad - \quad (352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/2)/25 \quad + \quad (352^{\circ}\cos((3^{\circ}$  $(3136 * \cos((3*t^22)/2)^2) / 25 + 13231 / 25)^6 (1/2) - 196 * \cos((3*t^22)/2) * \sin((3*t^22)/2) + 204)) / (49 * \sin((3*t^22)/2) ^2 - 112 * \sin((3*t^22)/2) - 168 * \cos((3*t^22)/2) + 49 * \cos((3*t^22)/2) ^2 - 12 * \sin((3*t^22)/2) ^2 - 12 * \sin((3*t^22)/2) + (3*t^22)/2) + (3*t^22) / (3*t^22)/2) + (3*t^22)/2) + (3*t^22) / (3*t^22)/2) + (3*t^$  $208) \ + \ (95^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(x^{\circ}((7^{\circ}\cos((3^{\circ}t^{\wedge}2)/2))/10 \ - \ 6/5) \ + \ 17/100))/((7^{\circ}\sin((3^{\circ}t^{\wedge}2)/2))/10 \ - \ 4/5) \ + \ (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2) \ - \ 336^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \ + \ (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)) \ - \ 36^{\circ}\sin((3^{\circ}t^{\wedge}2)/2) \ + \ (4^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/2)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/4)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)^{\wedge}2^{\circ}(105^{\circ}\cos((3^{\circ}t^{\wedge}2)/4)) \ - \ (36^{\circ}\tan((3^{\circ}t^{\wedge}2)/4)) \ - \ (3$  $294 * \sin((3*t^2)/2) + 40*((4116 * \sin((3*t^2)/2) + 40*((4116 * \sin((3*t^2)/2) + 2)/25 - (6328 * \sin((3*t^2)/2))/25 - (9492 * \cos((3*t^2)/2) + (2352 * \cos((3*t^2)/2) * \sin((3*t^2)/2))/25 + (3136 * \cos((3*t^2)/2) + (2352 * \cos((3*t^2)/2) + (2352$  $+ 13231/25)^{\circ}(1/2) - 35^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}((4116^{\circ}\sin((3^{\circ}t^{\circ}2)/2)^{\circ}2)/25 - (6328^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/25 - (9492^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 - (2352^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/25 + (1252^{\circ}\cos((3^{\circ}t^{\circ}2)/2)^{\circ}\sin((3^{\circ}t^{\circ}2)/2)/25 - (1252^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/25 - (1252^{\circ}\cos((3^{\circ}t^{\circ}2)/2)/$  $(3136 * \cos((3*t^2)/2)/2)/2/5 + 13231/25)(1/2) - 196 * \cos((3*t^2)/2) * \sin((3*t^2)/2) + 204)/(49*\sin((3*t^2)/2)^2 - 112*\sin((3*t^2)/2) - 168*\cos((3*t^2)/2) + 49*\cos((3*t^2)/2)^2 + 128\sin((3*t^2)/2) + 128\sin($ 208) - 14)