Modeling of malaria with cross-border mobility

$$S_{hH}' = \Lambda + q * R_{hH} + \eta * S_{hA} - b \frac{\alpha_{vh} I_{vH}}{N_{hH}} * S_{hH} - (d_h + \eta) * S_{hH} \ldots .1$$

$$I_{hH}' = b \frac{\alpha_{vh} I_{vH}}{N_{hH}} * S_{hH} + \theta * I_{hM} - (p + d_h + \delta_h + \gamma_h) * I_{hH} \ldots 2$$

$$R_{hH}' = \gamma_h * I_{hH} + \eta * R_{hA} - (\eta + d_h + q) * R_{hH} \ldots .3$$

$$S_{hA}' = \eta * S_{hH} + q * R_{hA} - (k + d_h + \eta) * S_{hA} \ldots .4$$

$$I_{hA}' = k * S_{hA} + \theta * I_{hH} - (\theta + d_h + \delta_h + \gamma_h) * I_{hA} \ldots .5$$

$$R_{hA}' = \gamma_h * I_{hA} + \eta * R_{hH} - (\eta + d_h + q) * R_{HA} \ldots .6$$

$$S_{vH}' = \phi - b \frac{\alpha_{hv} I_{hH}}{N_{hH}} * S_{vH} - d_v * S_{hH} \ldots .7$$

$$I_{vH}' = b \frac{\alpha_{hv} I_{hH}}{N_{hH}} * S_{vH} - d_v * S_{hH} \ldots 8$$

This is is a system of ordinary non-linear and non-homogenous autonomous differential equations after approximation of incidence in abroad.

In our system suppose that: $S_{hh} = x$, $I_{hh} = y$, $R_{hh} = z$, $S_{hA} = X$, $I_{hA} = Y$, $R_{hA} = Z$. Let $(x^*, y^*, z^*, X^*, Y^*, Z^*, l^*, m^*)$ is an endemic equilibrium point of the system of equation $(1-8)$. Let $\lambda_h^* = b \frac{\alpha_{vh} m^*}{N_{hh}^*} = \beta_h \frac{m^*}{N_{hh}^*}$, $\beta_h = b \alpha_{vh}$, $\lambda_v^* = b \frac{\alpha_{hv} y^*}{N_{hh}^*} = \beta_v \frac{y^*}{N_{hh}^*}$, $\beta_v = b \alpha_{hv}$, $p = \theta$(To moderate the simplification). Also, if we proceed with p and θ both then we reach to the same conclusion but the size of expression are little bit longer.

$$\Lambda + q * z^* + \eta * X^* - \lambda_h^* * x^* - (d_h + \eta) * x^* == 0 \ldots .1$$

$$\lambda_h^* * x^* + \theta * Y^* - (\theta + d_h + \delta_h + \gamma_h) * y^* == 0 \ldots .2$$

$$\gamma_h * y^* + \eta * Z^* - (\eta + d_h + q) * z^* == 0 \ldots 3$$

$$\eta * x^* + q * Z^* - (k + d_h + \eta) * X^* == 0 \ldots .4$$

$$k * X^* + \theta * y^* - (\theta + d_h + \delta_h + \gamma_h) * Y^* == 0 \ldots 5$$

$$\gamma_h * Y^* + \eta * z^* - (\eta + d_h + q) * Z^* == 0 \ldots 6$$

$$\lambda_v^* * (N_v^* - m^*) - d_v * m^* == 0 \ldots 7$$

$$\phi - d_v * N_v^* == 0 \ldots .8$$

The system of humans compartments at equilibrium point,

```
Solve[{Λ + q * z* + η * X* - λh* * x* - (dh + η) * x* == 0,
   λh* * x* + Θ * Y* - (Θ + dh + δh + γh) * y* == 0,
   γh * y* + η * Z* - (η + dh + q) * z* == 0,
   η * x* + q * Z* - (k + dh + η) * X* == 0,
k * X* + Θ * y* - (Θ + dh + δh + γh) * Y* == 0,
γh * Y* + η * z* - (η + dh + q) * Z* == 0}, {x*, y*, z*, X*, Y*, Z*}]
```

Solving the system we have,

$$
\begin{aligned}
x^* = {} & \Big(\Lambda\,\Big(d_h^5 + d_h^4\,(k + 2q + 3\eta + 2\Theta + 2\gamma_h + 2\delta_h) + d_h^3\,\Big(2kq + q^2 + 2k\eta + 4q\eta + 2\eta^2 + 2k\Theta + 4q\Theta + \\
& 6\eta\Theta + \gamma_h^2 + 2\,(k + 2q + 3\eta + \Theta)\,\delta_h + \delta_h^2 + 2\gamma_h\,(k + 2q + 3\eta + \Theta + \delta_h)\Big) + d_h^2\,\Big(kq^2 + \\
& 2kq\eta + q^2\eta + 2q\eta^2 + 4kq\Theta + 2q^2\Theta + 4k\eta\Theta + 8q\eta\Theta + 4\eta^2\Theta + (k + 2q + 3\eta)\,\gamma_h^2 + \\
& 2\,\Big(q^2 + 4q\eta + 2\eta^2 + 2q\Theta + 3\eta\Theta + k\,(2q + 2\eta + \Theta)\Big)\,\delta_h + (k + 2q + 3\eta)\,\delta_h^2 + \\
& \gamma_h\,\Big(3kq + 2q^2 + 4k\eta + 8q\eta + 4\eta^2 + 2k\Theta + 4q\Theta + 6\eta\Theta + 2\,(k + 2q + 3\eta)\,\delta_h\Big)\Big) + \\
& d_h\,\Big(2q\,(k + \eta)\,(q + 2\eta)\,\Theta + \Big(q^2 + 4q\eta + 2\eta^2 + k\,(q + 2\eta)\Big)\,\gamma_h^2 + \\
& 2\,\Big(2\eta^2\Theta + q^2\,(\eta + \Theta) + 2q\eta\,(\eta + 2\Theta) + k\,\Big(q^2 + 2\eta\Theta + 2q\,(\eta + \Theta)\Big)\Big)\,\delta_h + \\
& \Big(q^2 + 4q\eta + 2\eta^2 + 2k\,(q + \eta)\Big)\,\delta_h^2 + \gamma_h\,\Big(k\,\Big(q^2 + 4\eta\Theta + 3q\,(\eta + \Theta)\Big) + 2\,\Big(2\eta^2\Theta + q^2\,(\eta + \Theta) + 2q\eta\,(\eta + 2\Theta)\Big) + \Big(3kq + 2q^2 + 4k\eta + 8q\eta + 4\eta^2\Big)\,\delta_h\Big)\Big) + \\
& q\,\Big(\eta\,(k + q + 2\eta)\,\gamma_h^2 + (k + \eta)\,(q + 2\eta)\,\delta_h\,(2\Theta + \delta_h) + \\
& \gamma_h\,\big((k + 2\eta)\,(q + 2\eta)\,\Theta + (2\eta\,(q + 2\eta) + k\,(q + 3\eta))\,\delta_h\big)\Big)\Big) \Big/ \\
& \Big(d_h^6 + d_h^5\,(k + 2q + 4\eta + 2\Theta + 2\gamma_h + 2\delta_h + (\lambda_h)^*) + \\
& d_h^4\,\Big(2kq + q^2 + 3k\eta + 6q\eta + 4\eta^2 + 2k\Theta + 4q\Theta + 8\eta\Theta + \\
& \gamma_h^2 + \delta_h^2 + k\,(\lambda_h)^* + 2q\,(\lambda_h)^* + 3\eta\,(\lambda_h)^* + 2\Theta\,(\lambda_h)^* + \\
& 2\delta_h\,(k + 2q + 4\eta + \Theta + (\lambda_h)^*) + 2\gamma_h\,(k + 2q + 4\eta + \Theta + \delta_h + (\lambda_h)^*)\Big) + q\delta_h\,\big((q + 2\eta)\,(2\Theta + \delta_h)\,(k\eta + (k + \eta)\,(\lambda_h)^*) + \eta\gamma_h\,(k\,(q + 2\eta) + (2k + q + 2\eta)\,(\lambda_h)^*)\big) + \\
& d_h^3\,\Big(kq^2 + 4kq\eta + 2q^2\eta + 2k\eta^2 + 4q\eta^2 + 4kq\Theta + 2q^2\Theta + 6k\eta\Theta + 12q\eta\Theta + \\
& 8\eta^2\Theta + 2kq\,(\lambda_h)^* + q^2\,(\lambda_h)^* + 2k\eta\,(\lambda_h)^* + 4q\eta\,(\lambda_h)^* + 2\eta^2\,(\lambda_h)^* + 2k\Theta\,(\lambda_h)^* + \\
& 4q\Theta\,(\lambda_h)^* + 6\eta\Theta\,(\lambda_h)^* + \gamma_h^2\,(k + 2q + 4\eta + (\lambda_h)^*) + \delta_h^2\,(k + 2q + 4\eta + (\lambda_h)^*) + \\
& 2\delta_h\,\Big(q^2 + 6q\eta + 4\eta^2 + 2q\Theta + 4\eta\Theta + k\,(2q + 3\eta + \Theta) + (k + 2q + 3\eta + \Theta)\,(\lambda_h)^*\Big) + \\
& \gamma_h\,\Big(3kq + 2q^2 + 6k\eta + 12q\eta + 8\eta^2 + 2k\Theta + 4q\Theta + 8\eta\Theta + \\
& (2k + 3q + 6\eta + 2\Theta)\,(\lambda_h)^* + 2\delta_h\,(k + 2q + 4\eta + (\lambda_h)^*)\Big)\Big) + \\
& d_h^2\,\Big(kq^2\eta + 2kq\eta^2 + 2kq^2\Theta + 8kq\eta\Theta + 4q^2\eta\Theta + 4k\eta^2\Theta + 8q\eta^2\Theta + kq^2\,(\lambda_h)^* + \\
& 2kq\eta\,(\lambda_h)^* + q^2\eta\,(\lambda_h)^* + 2q\eta^2\,(\lambda_h)^* + 4kq\Theta\,(\lambda_h)^* + 2q^2\Theta\,(\lambda_h)^* + 4k\eta\Theta\,(\lambda_h)^* + \\
& 8q\eta\Theta\,(\lambda_h)^* + 4\eta^2\Theta\,(\lambda_h)^* + \gamma_h^2\,\Big(q^2 + 6q\eta + 4\eta^2 + k\,(q + 3\eta) + (k + q + 3\eta)\,(\lambda_h)^*\Big) + \\
& \delta_h^2\,\Big(2kq + q^2 + 3k\eta + 6q\eta + 4\eta^2 + (k + 2q + 3\eta)\,(\lambda_h)^*\Big) + \\
& 2\delta_h\,\Big(2q^2\eta + 4q\eta^2 + q^2\Theta + 6q\eta\Theta + 4\eta^2\Theta + k\,\Big(q^2 + 4q\eta + 2\eta^2 + 2q\Theta + 3\eta\Theta\Big) + \\
& \Big(q^2 + 4q\eta + 2\eta^2 + 2q\Theta + 3\eta\Theta + k\,(2q + 2\eta + \Theta)\Big)\,(\lambda_h)^*\Big) + \\
& \gamma_h\,\Big(kq^2 + 6kq\eta + 4q^2\eta + 4k\eta^2 + 8q\eta^2 + 3kq\Theta + 2q^2\Theta + 6k\eta\Theta + 12q\eta\Theta + \\
& 8\eta^2\Theta + \Big(q^2 + 6q\eta + 4\eta^2 + 3q\Theta + 6\eta\Theta + 2k\,(q + 2\eta + \Theta)\Big)\,(\lambda_h)^* + \\
& \delta_h\,\Big(3kq + 2q^2 + 6k\eta + 12q\eta + 8\eta^2 + (2k + 3q + 6\eta)\,(\lambda_h)^*\Big)\Big)\Big) +
\end{aligned}
$$

$$d_h \left(2\,q\,(q+2\,\eta)\,\Theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2\right.$$
$$(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+$$
$$\delta_h^2\left(2\,q\,\eta\,(q+2\,\eta)+k\left(q^2+4\,q\,\eta+2\,\eta^2\right)+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q\,\eta\,(q+2\,\eta)\,\Theta+k\left(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)\right)+\right.$$
$$\left.\left(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)+k\left(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\right)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left((q+2\,\eta)\,(4\,q\,\eta\,\Theta+k\,(2\,\eta\,\Theta+q\,(\eta+\Theta)))+(2\,k+q+2\,\eta)\right.$$
$$(2\,\eta\,\Theta+q\,(\eta+\Theta))\,(\lambda_h)^*+\delta_h\left(4\,q\,\eta\,(q+2\,\eta)+\right.$$
$$\left.\left.\left.k\left(q^2+6\,q\,\eta+4\,\eta^2\right)+\left(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\right)(\lambda_h)^*\right)\right)\right)$$

$$x^* = P\,/\,(K_1+K_2\,(\lambda_h)^*)$$

$$y^* = \left(\Lambda\left(d_h^4\,(\lambda_h)^*+d_h^3\,(k+2\,q+3\,\eta+\Theta+\gamma_h+\delta_h)\,(\lambda_h)^*+\right.\right.$$
$$d_h^2\left(k\,\eta\,\Theta+\left(2\,k\,q+q^2+2\,k\,\eta+4\,q\,\eta+2\,\eta^2+k\,\Theta+2\,q\,\Theta+3\,\eta\,\Theta+\right.\right.$$
$$\left.(k+2\,q+3\,\eta)\,\gamma_h+(k+2\,q+3\,\eta)\,\delta_h\right)(\lambda_h)^*\Big)+d_h\left(2\,k\,\eta\,(q+\eta)\,\Theta+\right.$$
$$\left(k\,q^2+2\,k\,q\,\eta+q^2\,\eta+2\,q\,\eta^2+2\,k\,q\,\Theta+q^2\,\Theta+2\,k\,\eta\,\Theta+4\,q\,\eta\,\Theta+2\,\eta^2\,\Theta+\right.$$
$$\left.\left.\left(q^2+4\,q\,\eta+2\,\eta^2+k\,(q+2\,\eta)\right)\gamma_h+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\delta_h\right)(\lambda_h)^*\Big)+$$
$$\left.\left.q\,(k\,\eta\,(q+2\,\eta)\,\Theta+(\eta\,(k+q+2\,\eta)\,\gamma_h+(k+\eta)\,(q+2\,\eta)\,(\Theta+\delta_h))\,(\lambda_h)^*)\right)\right)\Big/$$
$$\left(d_h^6+d_h^5\,(k+2\,q+4\,\eta+2\,\Theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*)+\right.$$
$$d_h^4\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\right.$$
$$\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+2\,\Theta\,(\lambda_h)^*+$$
$$\left.2\,\delta_h\,(k+2\,q+4\,\eta+\Theta+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+4\,\eta+\Theta+\delta_h+(\lambda_h)^*)\right)+q\,\delta_h$$
$$((q+2\,\eta)\,(2\,\Theta+\delta_h)\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+\eta\,\gamma_h\,(k\,(q+2\,\eta)+(2\,k+q+2\,\eta)\,(\lambda_h)^*))+$$
$$d_h^3\left(k\,q^2+4\,k\,q\,\eta+2\,q^2\,\eta+2\,k\,\eta^2+4\,q\,\eta^2+4\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+\right.$$
$$8\,\eta^2\,\Theta+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+2\,\eta^2\,(\lambda_h)^*+2\,k\,\Theta\,(\lambda_h)^*+$$
$$4\,q\,\Theta\,(\lambda_h)^*+6\,\eta\,\Theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\delta_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+$$
$$2\,\delta_h\left(q^2+6\,q\,\eta+4\,\eta^2+2\,q\,\Theta+4\,\eta\,\Theta+k\,(2\,q+3\,\eta+\Theta)+(k+2\,q+3\,\eta+\Theta)\,(\lambda_h)^*\right)+$$
$$\gamma_h\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\right.$$
$$\left.(2\,k+3\,q+6\,\eta+2\,\Theta)\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+(\lambda_h)^*)\right)+$$
$$d_h^2\left(k\,q^2\,\eta+2\,k\,q\,\eta^2+2\,k\,q^2\,\Theta+8\,k\,q\,\eta\,\Theta+4\,q^2\,\eta\,\Theta+4\,k\,\eta^2\,\Theta+8\,q\,\eta^2\,\Theta+k\,q^2\,(\lambda_h)^*+\right.$$
$$2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+4\,k\,q\,\Theta\,(\lambda_h)^*+2\,q^2\,\Theta\,(\lambda_h)^*+4\,k\,\eta\,\Theta\,(\lambda_h)^*+$$
$$8\,q\,\eta\,\Theta\,(\lambda_h)^*+4\,\eta^2\,\Theta\,(\lambda_h)^*+\gamma_h^2\left(q^2+6\,q\,\eta+4\,\eta^2+k\,(q+3\,\eta)+(k+q+3\,\eta)\,(\lambda_h)^*\right)+$$
$$\delta_h^2\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+(k+2\,q+3\,\eta)\,(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q^2\,\eta+4\,q\,\eta^2+q^2\,\Theta+6\,q\,\eta\,\Theta+4\,\eta^2\,\Theta+k\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta\right)+\right.$$
$$\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta+k\,(2\,q+2\,\eta+\Theta)\right)(\lambda_h)^*\Big)+$$
$$\gamma_h\left(k\,q^2+6\,k\,q\,\eta+4\,q^2\,\eta+4\,k\,\eta^2+8\,q\,\eta^2+3\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+\right.$$
$$8\,\eta^2\,\Theta+\left(q^2+6\,q\,\eta+4\,\eta^2+3\,q\,\Theta+6\,\eta\,\Theta+2\,k\,(q+2\,\eta+\Theta)\right)(\lambda_h)^*+$$
$$\left.\delta_h\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+(2\,k+3\,q+6\,\eta)\,(\lambda_h)^*\right)\right)+$$
$$d_h\left(2\,q\,(q+2\,\eta)\,\Theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2\right.$$
$$(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+$$

$$\delta_h^2 \left(2\,q\,\eta\,(q+2\,\eta)+k\left(q^2+4\,q\,\eta+2\,\eta^2\right)+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q\,\eta\,(q+2\,\eta)\,\theta+k\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)\right)+\right.$$
$$\left.\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)+k\left(q^2+2\,\eta\,\theta+2\,q\,(\eta+\theta)\right)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left((q+2\,\eta)\,(4\,q\,\eta\,\theta+k\,(2\,\eta\,\theta+q\,(\eta+\theta)))+(2\,k+q+2\,\eta)\right.$$
$$(2\,\eta\,\theta+q\,(\eta+\theta))\,(\lambda_h)^*+\delta_h\left(4\,q\,\eta\,(q+2\,\eta)+\right.$$
$$\left.\left.\left.k\left(q^2+6\,q\,\eta+4\,\eta^2\right)+\left(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\right)(\lambda_h)^*\right)\right)\right)$$

$$y^* = (Q_1+Q_2\,(\lambda_h)^*)\,/\,((K_1+K_2\,(\lambda_h)^*))$$

$$z^* =$$
$$\left(\Lambda\,\gamma_h\left(k\,q\,\eta\,\theta+2\,k\,\eta^2\,\theta+k\,\eta^2\,\delta_h+k\,q\,\theta\,(\lambda_h)^*+2\,k\,\eta\,\theta\,(\lambda_h)^*+q\,\eta\,\theta\,(\lambda_h)^*+2\,\eta^2\,\theta\,(\lambda_h)^*+d_h^3\right.\right.$$
$$(\lambda_h)^*+k\,q\,\delta_h\,(\lambda_h)^*+k\,\eta\,\delta_h\,(\lambda_h)^*+q\,\eta\,\delta_h\,(\lambda_h)^*+\eta^2\,\delta_h\,(\lambda_h)^*+$$
$$d_h^2\,(k+q+2\,\eta+\theta+\gamma_h+\delta_h)\,(\lambda_h)^*+\eta\,\gamma_h\,(k\,\eta+(k+q+\eta)\,(\lambda_h)^*)+d_h\left(k\,\eta\,(\eta+\theta)+\right.$$
$$\left.\left.\left.\left(k\,q+k\,\eta+q\,\eta+\eta^2+k\,\theta+q\,\theta+3\,\eta\,\theta+(k+q+2\,\eta)\,\gamma_h+(k+q+2\,\eta)\,\delta_h\right)(\lambda_h)^*\right)\right)\right)\Big/$$
$$\left(d_h^6+d_h^5\,(k+2\,q+4\,\eta+2\,\theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*)+d_h^4\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+\right.\right.$$
$$4\,\eta^2+2\,k\,\theta+4\,q\,\theta+8\,\eta\,\theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+2\,\theta\,(\lambda_h)^*+$$
$$2\,\delta_h\,(k+2\,q+4\,\eta+\theta+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+4\,\eta+\theta+\delta_h+(\lambda_h)^*)\Big)+q\,\delta_h$$
$$((q+2\,\eta)\,(2\,\theta+\delta_h)\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+\eta\,\gamma_h\,(k\,(q+2\,\eta)+(2\,k+q+2\,\eta)\,(\lambda_h)^*))+$$
$$d_h^3\left(k\,q^2+4\,k\,q\,\eta+2\,q^2\,\eta+2\,k\,\eta^2+4\,q\,\eta^2+4\,k\,q\,\theta+2\,q^2\,\theta+6\,k\,\eta\,\theta+12\,q\,\eta\,\theta+\right.$$
$$8\,\eta^2\,\theta+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+2\,\eta^2\,(\lambda_h)^*+2\,k\,\theta\,(\lambda_h)^*+$$
$$4\,q\,\theta\,(\lambda_h)^*+6\,\eta\,\theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\delta_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+$$
$$2\,\delta_h\left(q^2+6\,q\,\eta+4\,\eta^2+2\,q\,\theta+4\,\eta\,\theta+k\,(2\,q+3\,\eta+\theta)+(k+2\,q+3\,\eta+\theta)\,(\lambda_h)^*\right)+$$
$$\gamma_h\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+2\,k\,\theta+4\,q\,\theta+8\,\eta\,\theta+\right.$$
$$\left.(2\,k+3\,q+6\,\eta+2\,\theta)\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+(\lambda_h)^*)\right)+$$
$$d_h^2\left(k\,q^2\,\eta+2\,k\,q\,\eta^2+2\,k\,q^2\,\theta+8\,k\,q\,\eta\,\theta+4\,q^2\,\eta\,\theta+4\,k\,\eta^2\,\theta+8\,q\,\eta^2\,\theta+k\,q^2\,(\lambda_h)^*+\right.$$
$$2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+4\,k\,q\,\theta\,(\lambda_h)^*+2\,q^2\,\theta\,(\lambda_h)^*+4\,k\,\eta\,\theta\,(\lambda_h)^*+$$
$$8\,q\,\eta\,\theta\,(\lambda_h)^*+4\,\eta^2\,\theta\,(\lambda_h)^*+\gamma_h^2\left(q^2+6\,q\,\eta+4\,\eta^2+k\,(q+3\,\eta)+(k+q+3\,\eta)\,(\lambda_h)^*\right)+$$
$$\delta_h^2\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+(k+2\,q+3\,\eta)\,(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q^2\,\eta+4\,q\,\eta^2+q^2\,\theta+6\,q\,\eta\,\theta+4\,\eta^2\,\theta+k\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\theta+3\,\eta\,\theta\right)+\right.$$
$$\left.\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\theta+3\,\eta\,\theta+k\,(2\,q+2\,\eta+\theta)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left(k\,q^2+6\,k\,q\,\eta+4\,q^2\,\eta+4\,k\,\eta^2+8\,q\,\eta^2+3\,k\,q\,\theta+2\,q^2\,\theta+6\,k\,\eta\,\theta+12\,q\,\eta\,\theta+\right.$$
$$8\,\eta^2\,\theta+\left(q^2+6\,q\,\eta+4\,\eta^2+3\,q\,\theta+6\,\eta\,\theta+2\,k\,(q+2\,\eta+\theta)\right)(\lambda_h)^*+$$
$$\left.\left.\delta_h\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+(2\,k+3\,q+6\,\eta)\,(\lambda_h)^*\right)\right)+\right.$$
$$d_h\left(2\,q\,(q+2\,\eta)\,\theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2\right.$$
$$(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+$$
$$\delta_h^2\left(2\,q\,\eta\,(q+2\,\eta)+k\left(q^2+4\,q\,\eta+2\,\eta^2\right)+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q\,\eta\,(q+2\,\eta)\,\theta+k\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)\right)+\right.$$
$$\left.\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)+k\left(q^2+2\,\eta\,\theta+2\,q\,(\eta+\theta)\right)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left((q+2\,\eta)\,(4\,q\,\eta\,\theta+k\,(2\,\eta\,\theta+q\,(\eta+\theta)))+(2\,k+q+2\,\eta)\right.$$

$$(2\,\eta\,\Theta + q\,(\eta+\Theta))\,(\lambda_h)^* + \delta_h\,\Big(4\,q\,\eta\,(q+2\,\eta) + k\,\left(q^2+6\,q\,\eta+4\,\eta^2\right) + \left(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\right)\,(\lambda_h)^*\Big)\Big)\Big)$$

$$z = Q_3 + Q_4\,(\lambda_h)^* \,/\, ((K_1 + K_2\,(\lambda_h)^*))$$

$$\begin{aligned}
X^* = {} & \Big(\Lambda\,\Big(\eta\,d_h^4 + 2\,\eta\,d_h^3\,(q+\eta+\Theta+\gamma_h+\delta_h) + \\
& \eta\,d_h^2\,\left(q^2+2\,q\,\eta+4\,q\,\Theta+4\,\eta\,\Theta+\gamma_h^2+2\,(2\,q+2\,\eta+\Theta)\,\delta_h+\delta_h^2+2\,\gamma_h\,(2\,q+2\,\eta+\Theta+\delta_h)\right) + \\
& d_h\,\Big(2\,\eta\,(q+\eta)\,\gamma_h^2+2\,\eta\,\left(q\,(q+2\,\eta)\,\Theta+\left(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\right)\,\delta_h+(q+\eta)\,\delta_h^2\right) + \\
& \gamma_h\,\left(2\,\eta\,\left(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\right)+4\,\eta\,(q+\eta)\,\delta_h+q\,(\eta+\Theta)\,(\lambda_h)^*\right)\Big) + \\
& q\,\Big(\eta\,(q+2\,\eta)\,\delta_h\,(2\,\Theta+\delta_h)+\eta\,\gamma_h^2\,(q+2\,\eta+(\lambda_h)^*) + \\
& \gamma_h\,((q+2\,\eta)\,\Theta\,(2\,\eta+(\lambda_h)^*)+\eta\,\delta_h\,(2\,q+4\,\eta+(\lambda_h)^*))\Big)\Big)\Big) \,/ \\
& \Big(d_h^6 + d_h^5\,(k+2\,q+4\,\eta+2\,\Theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*) + d_h^4\,\Big(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta + \\
& 4\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+2\,\Theta\,(\lambda_h)^* + \\
& 2\,\delta_h\,(k+2\,q+4\,\eta+\Theta+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+4\,\eta+\Theta+\delta_h+(\lambda_h)^*)\Big)+q\,\delta_h \\
& ((q+2\,\eta)\,(2\,\Theta+\delta_h)\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+\eta\,\gamma_h\,(k\,(q+2\,\eta)+(2\,k+q+2\,\eta)\,(\lambda_h)^*))+ \\
& d_h^3\,\Big(k\,q^2+4\,k\,q\,\eta+2\,q^2\,\eta+2\,k\,\eta^2+4\,q\,\eta^2+4\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta + \\
& 8\,\eta^2\,\Theta+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+2\,\eta^2\,(\lambda_h)^*+2\,k\,\Theta\,(\lambda_h)^* + \\
& 4\,q\,\Theta\,(\lambda_h)^*+6\,\eta\,\Theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\delta_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*) + \\
& 2\,\delta_h\,\left(q^2+6\,q\,\eta+4\,\eta^2+2\,q\,\Theta+4\,\eta\,\Theta+k\,(2\,q+3\,\eta+\Theta)+(k+2\,q+3\,\eta+\Theta)\,(\lambda_h)^*\right) + \\
& \gamma_h\,\Big(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta + \\
& (2\,k+3\,q+6\,\eta+2\,\Theta)\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+(\lambda_h)^*)\Big)\Big)+ \\
& d_h^2\,\Big(k\,q^2\,\eta+2\,k\,q\,\eta^2+2\,k\,q^2\,\Theta+8\,k\,q\,\eta\,\Theta+4\,q^2\,\eta\,\Theta+4\,k\,\eta^2\,\Theta+8\,q\,\eta^2\,\Theta+k\,q^2\,(\lambda_h)^* + \\
& 2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+4\,k\,q\,\Theta\,(\lambda_h)^*+2\,q^2\,\Theta\,(\lambda_h)^*+4\,k\,\eta\,\Theta\,(\lambda_h)^* + \\
& 8\,q\,\eta\,\Theta\,(\lambda_h)^*+4\,\eta^2\,\Theta\,(\lambda_h)^*+\gamma_h^2\,\left(q^2+6\,q\,\eta+4\,\eta^2+k\,(q+3\,\eta)+(k+q+3\,\eta)\,(\lambda_h)^*\right) + \\
& \delta_h^2\,\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+(k+2\,q+3\,\eta)\,(\lambda_h)^*\right) + \\
& 2\,\delta_h\,\left(2\,q^2\,\eta+4\,q\,\eta^2+q^2\,\Theta+6\,q\,\eta\,\Theta+4\,\eta^2\,\Theta+k\,\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta\right) + \right. \\
& \left.\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta+k\,(2\,q+2\,\eta+\Theta)\right)\,(\lambda_h)^*\right) + \\
& \gamma_h\,\Big(k\,q^2+6\,k\,q\,\eta+4\,q^2\,\eta+4\,k\,\eta^2+8\,q\,\eta^2+3\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta + \\
& 8\,\eta^2\,\Theta+\left(q^2+6\,q\,\eta+4\,\eta^2+3\,q\,\Theta+6\,\eta\,\Theta+2\,k\,(q+2\,\eta+\Theta)\right)\,(\lambda_h)^* + \\
& \delta_h\,\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+(2\,k+3\,q+6\,\eta)\,(\lambda_h)^*\right)\Big) + \\
& d_h\,\Big(2\,q\,(q+2\,\eta)\,\Theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2 \\
& (k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*) + \\
& \delta_h^2\,\left(2\,q\,\eta\,(q+2\,\eta)+k\,\left(q^2+4\,q\,\eta+2\,\eta^2\right)+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\,(\lambda_h)^*\right) + \\
& 2\,\delta_h\,\left(2\,q\,\eta\,(q+2\,\eta)\,\Theta+k\,\left(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)\right) + \right. \\
& \left.\left(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)+k\,\left(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\right)\right)\,(\lambda_h)^*\right) + \\
& \gamma_h\,\left((q+2\,\eta)\,(4\,q\,\eta\,\Theta+k\,(2\,\eta\,\Theta+q\,(\eta+\Theta)))+(2\,k+q+2\,\eta)\right. \\
& (2\,\eta\,\Theta+q\,(\eta+\Theta))\,(\lambda_h)^*+\delta_h\,\left(4\,q\,\eta\,(q+2\,\eta)+\right. \\
& \left.\left.\left.k\,\left(q^2+6\,q\,\eta+4\,\eta^2\right)+\left(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\right)\,(\lambda_h)^*\right)\right)\right)
\end{aligned}$$

$$X^* = S_1 + S_2\ (\lambda_h)^* \ /\ ((K_1 + K_2\ (\lambda_h)^*))$$

$$\begin{aligned}
Y^* = {} & \Big(\Lambda \Big(d_h^3\ (k\,\eta + \theta\ (\lambda_h)^*) + \\
& d_h^2 \Big(2\,k\,q\,\eta + 2\,k\,\eta^2 + k\,\eta\,\theta + k\,\eta\,\gamma_h + k\,\eta\,\delta_h + k\,\theta\ (\lambda_h)^* + 2\,q\,\theta\ (\lambda_h)^* + 3\,\eta\,\theta\ (\lambda_h)^*\Big) + \\
& d_h \Big(k\,q^2\,\eta + 2\,k\,q\,\eta^2 + 2\,k\,q\,\eta\,\theta + 2\,k\,\eta^2\,\theta + 2\,k\,\eta\ (q+\eta)\ \gamma_h + 2\,k\,\eta\ (q+\eta)\ \delta_h + \\
& \quad 2\,k\,q\,\theta\ (\lambda_h)^* + q^2\,\theta\ (\lambda_h)^* + 2\,k\,\eta\,\theta\ (\lambda_h)^* + 4\,q\,\eta\,\theta\ (\lambda_h)^* + 2\,\eta^2\,\theta\ (\lambda_h)^*\Big) + \\
& q\ (k\,\eta\,\gamma_h\ (q + 2\,\eta + (\lambda_h)^*) + (q + 2\,\eta)\ (k\,\eta\,\delta_h + \theta\ (k\,\eta + (k+\eta)\ (\lambda_h)^*)))\Big)\Big) \Big/ \\
& \Big(d_h^6 + d_h^5\ (k + 2\,q + 4\,\eta + 2\,\theta + 2\,\gamma_h + 2\,\delta_h + (\lambda_h)^*) + d_h^4 \Big(2\,k\,q + q^2 + 3\,k\,\eta + 6\,q\,\eta + \\
& \quad 4\,\eta^2 + 2\,k\,\theta + 4\,q\,\theta + 8\,\eta\,\theta + \gamma_h^2 + \delta_h^2 + k\ (\lambda_h)^* + 2\,q\ (\lambda_h)^* + 3\,\eta\ (\lambda_h)^* + 2\,\theta\ (\lambda_h)^* + \\
& \quad 2\,\delta_h\ (k + 2\,q + 4\,\eta + \theta + (\lambda_h)^*) + 2\,\gamma_h\ (k + 2\,q + 4\,\eta + \theta + \delta_h + (\lambda_h)^*)\Big) + q\,\delta_h \\
& \quad ((q + 2\,\eta)\ (2\,\theta + \delta_h)\ (k\,\eta + (k+\eta)\ (\lambda_h)^*) + \eta\,\gamma_h\ (k\ (q + 2\,\eta) + (2\,k + q + 2\,\eta)\ (\lambda_h)^*)) + \\
& \quad d_h^3 \Big(k\,q^2 + 4\,k\,q\,\eta + 2\,q^2\,\eta + 2\,k\,\eta^2 + 4\,q\,\eta^2 + 4\,k\,q\,\theta + 2\,q^2\,\theta + 6\,k\,\eta\,\theta + 12\,q\,\eta\,\theta + \\
& \quad 8\,\eta^2\,\theta + 2\,k\,q\ (\lambda_h)^* + q^2\ (\lambda_h)^* + 2\,k\,\eta\ (\lambda_h)^* + 4\,q\,\eta\ (\lambda_h)^* + 2\,\eta^2\ (\lambda_h)^* + 2\,k\,\theta\ (\lambda_h)^* + \\
& \quad 4\,q\,\theta\ (\lambda_h)^* + 6\,\eta\,\theta\ (\lambda_h)^* + \gamma_h^2\ (k + 2\,q + 4\,\eta + (\lambda_h)^*) + \delta_h^2\ (k + 2\,q + 4\,\eta + (\lambda_h)^*) + \\
& \quad 2\,\delta_h \Big(q^2 + 6\,q\,\eta + 4\,\eta^2 + 2\,q\,\theta + 4\,\eta\,\theta + k\ (2\,q + 3\,\eta + \theta) + (k + 2\,q + 3\,\eta + \theta)\ (\lambda_h)^*\Big) + \\
& \quad \gamma_h \Big(3\,k\,q + 2\,q^2 + 6\,k\,\eta + 12\,q\,\eta + 8\,\eta^2 + 2\,k\,\theta + 4\,q\,\theta + 8\,\eta\,\theta + \\
& \quad\quad (2\,k + 3\,q + 6\,\eta + 2\,\theta)\ (\lambda_h)^* + 2\,\delta_h\ (k + 2\,q + 4\,\eta + (\lambda_h)^*)\Big)\Big) + \\
& \quad d_h^2 \Big(k\,q^2\,\eta + 2\,k\,q\,\eta^2 + 2\,k\,q^2\,\theta + 8\,k\,q\,\eta\,\theta + 4\,q^2\,\eta\,\theta + 4\,k\,\eta^2\,\theta + 8\,q\,\eta^2\,\theta + k\,q^2\ (\lambda_h)^* + \\
& \quad 2\,k\,q\,\eta\ (\lambda_h)^* + q^2\,\eta\ (\lambda_h)^* + 2\,q\,\eta^2\ (\lambda_h)^* + 4\,k\,q\,\theta\ (\lambda_h)^* + 2\,q^2\,\theta\ (\lambda_h)^* + 4\,k\,\eta\,\theta\ (\lambda_h)^* + \\
& \quad 8\,q\,\eta\,\theta\ (\lambda_h)^* + 4\,\eta^2\,\theta\ (\lambda_h)^* + \gamma_h^2 \Big(q^2 + 6\,q\,\eta + 4\,\eta^2 + k\ (q + 3\,\eta) + (k + q + 3\,\eta)\ (\lambda_h)^*\Big) + \\
& \quad \delta_h^2 \Big(2\,k\,q + q^2 + 3\,k\,\eta + 6\,q\,\eta + 4\,\eta^2 + (k + 2\,q + 3\,\eta)\ (\lambda_h)^*\Big) + \\
& \quad 2\,\delta_h \Big(2\,q^2\,\eta + 4\,q\,\eta^2 + q^2\,\theta + 6\,q\,\eta\,\theta + 4\,\eta^2\,\theta + k\ \Big(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,q\,\theta + 3\,\eta\,\theta\Big) + \\
& \quad\quad \Big(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,q\,\theta + 3\,\eta\,\theta + k\ (2\,q + 2\,\eta + \theta)\Big)\ (\lambda_h)^*\Big) + \\
& \quad \gamma_h \Big(k\,q^2 + 6\,k\,q\,\eta + 4\,q^2\,\eta + 4\,k\,\eta^2 + 8\,q\,\eta^2 + 3\,k\,q\,\theta + 2\,q^2\,\theta + 6\,k\,\eta\,\theta + 12\,q\,\eta\,\theta + \\
& \quad\quad 8\,\eta^2\,\theta + \Big(q^2 + 6\,q\,\eta + 4\,\eta^2 + 3\,q\,\theta + 6\,\eta\,\theta + 2\,k\ (q + 2\,\eta + \theta)\Big)\ (\lambda_h)^* + \\
& \quad\quad \delta_h \Big(3\,k\,q + 2\,q^2 + 6\,k\,\eta + 12\,q\,\eta + 8\,\eta^2 + (2\,k + 3\,q + 6\,\eta)\ (\lambda_h)^*\Big)\Big)\Big) + \\
& \quad d_h \Big(2\,q\ (q + 2\,\eta)\ \theta\ (k\,\eta + (k+\eta)\ (\lambda_h)^*) + 2\,\eta\,\gamma_h^2 \\
& \quad\quad (k\ (q+\eta) + q\ (q + 2\,\eta) + (k + q + \eta)\ (\lambda_h)^* + \\
& \quad\quad \delta_h^2 \Big(2\,q\,\eta\ (q + 2\,\eta) + k\ \Big(q^2 + 4\,q\,\eta + 2\,\eta^2\Big) + \Big(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,k\ (q+\eta)\Big)\ (\lambda_h)^*\Big) + \\
& \quad\quad 2\,\delta_h \Big(2\,q\,\eta\ (q + 2\,\eta)\ \theta + k\ \Big(2\,\eta^2\,\theta + q^2\ (\eta + \theta) + 2\,q\,\eta\ (\eta + 2\,\theta)\Big) + \\
& \quad\quad\quad \Big(2\,\eta^2\,\theta + q^2\ (\eta + \theta) + 2\,q\,\eta\ (\eta + 2\,\theta) + k\ \Big(q^2 + 2\,\eta\,\theta + 2\,q\ (\eta + \theta)\Big)\Big)\ (\lambda_h)^*\Big) + \\
& \quad\quad \gamma_h \Big((q + 2\,\eta)\ (4\,q\,\eta\,\theta + k\ (2\,\eta\,\theta + q\ (\eta + \theta))) + (2\,k + q + 2\,\eta) \\
& \quad\quad\quad (2\,\eta\,\theta + q\ (\eta + \theta))\ (\lambda_h)^* + \delta_h \Big(4\,q\,\eta\ (q + 2\,\eta) + \\
& \quad\quad\quad k\ \Big(q^2 + 6\,q\,\eta + 4\,\eta^2\Big) + \Big(q^2 + 6\,q\,\eta + 4\,\eta^2 + 2\,k\ (q + 2\,\eta)\Big)\ (\lambda_h)^*\Big)\Big)\Big)
\end{aligned}$$

$$Y^* = T_1 + T_2\ (\lambda_h)^* \ /\ ((K_1 + K_2\ (\lambda_h)^*))$$

$$Z^* =$$

$$\Big(\Lambda\,\gamma_h\,\Big(k\,q\,\eta\,\Theta+2\,k\,\eta^2\,\Theta+k\,q\,\eta\,\delta_h+k\,\eta^2\,\delta_h+k\,q\,\Theta\,(\lambda_h)^*+2\,k\,\eta\,\Theta\,(\lambda_h)^*+q\,\eta\,\Theta\,(\lambda_h)^*+2\,\eta^2\,\Theta\,(\lambda_h)^*+k\,\eta\,\delta_h\,(\lambda_h)^*+\eta^2\,\delta_h\,(\lambda_h)^*+\eta\,\gamma_h\,(k\,(q+\eta)+(k+\eta)\,(\lambda_h)^*)+d_h^2\,(k\,\eta+(\eta+\Theta)\,(\lambda_h)^*)+d_h\,\Big(k\,q\,\eta+k\,\eta^2+k\,\eta\,\Theta+k\,\eta\,(\lambda_h)^*+\eta^2\,(\lambda_h)^*+k\,\Theta\,(\lambda_h)^*+q\,\Theta\,(\lambda_h)^*+3\,\eta\,\Theta\,(\lambda_h)^*+\eta\,\gamma_h\,(k+(\lambda_h)^*)+\eta\,\delta_h\,(k+(\lambda_h)^*)\Big)\Big)\Big)\Big/\Big(d_h^6+d_h^5\,(k+2\,q+4\,\eta+2\,\Theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*)+d_h^4\,\Big(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+2\,\Theta\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+\Theta+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+4\,\eta+\Theta+\delta_h+(\lambda_h)^*)\Big)+q\,\delta_h\,((q+2\,\eta)\,(2\,\Theta+\delta_h)\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+\eta\,\gamma_h\,(k\,(q+2\,\eta)+(2\,k+q+2\,\eta)\,(\lambda_h)^*))+d_h^3\,\Big(k\,q^2+4\,k\,q\,\eta+2\,q^2\,\eta+2\,k\,\eta^2+4\,q\,\eta^2+4\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+8\,\eta^2\,\Theta+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+2\,\eta^2\,(\lambda_h)^*+2\,k\,\Theta\,(\lambda_h)^*+4\,q\,\Theta\,(\lambda_h)^*+6\,\eta\,\Theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\delta_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+2\,\delta_h\,\Big(q^2+6\,q\,\eta+4\,\eta^2+2\,q\,\Theta+4\,\eta\,\Theta+k\,(2\,q+3\,\eta+\Theta)+(k+2\,q+3\,\eta+\Theta)\,(\lambda_h)^*\Big)+\gamma_h\,\Big(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+(2\,k+3\,q+6\,\eta+2\,\Theta)\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+(\lambda_h)^*)\Big)\Big)+d_h^2\,\Big(k\,q^2\,\eta+2\,k\,q\,\eta^2+2\,k\,q^2\,\Theta+8\,k\,q\,\eta\,\Theta+4\,q^2\,\eta\,\Theta+4\,k\,\eta^2\,\Theta+8\,q\,\eta^2\,\Theta+k\,q^2\,(\lambda_h)^*+2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+4\,k\,q\,\Theta\,(\lambda_h)^*+2\,q^2\,\Theta\,(\lambda_h)^*+4\,k\,\eta\,\Theta\,(\lambda_h)^*+8\,q\,\eta\,\Theta\,(\lambda_h)^*+4\,\eta^2\,\Theta\,(\lambda_h)^*+\gamma_h^2\,\Big(q^2+6\,q\,\eta+4\,\eta^2+k\,(q+3\,\eta)+(k+q+3\,\eta)\,(\lambda_h)^*\Big)+\delta_h^2\,\Big(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+(k+2\,q+3\,\eta)\,(\lambda_h)^*\Big)+2\,\delta_h\,\Big(2\,q^2\,\eta+4\,q\,\eta^2+q^2\,\Theta+6\,q\,\eta\,\Theta+4\,\eta^2\,\Theta+k\,\Big(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta\Big)+\Big(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta+k\,(2\,q+2\,\eta+\Theta)\Big)\,(\lambda_h)^*\Big)+\gamma_h\,\Big(k\,q^2+6\,k\,q\,\eta+4\,q^2\,\eta+4\,k\,\eta^2+8\,q\,\eta^2+3\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+8\,\eta^2\,\Theta+\Big(q^2+6\,q\,\eta+4\,\eta^2+3\,q\,\Theta+6\,\eta\,\Theta+2\,k\,(q+2\,\eta+\Theta)\Big)\,(\lambda_h)^*+\delta_h\,\Big(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+(2\,k+3\,q+6\,\eta)\,(\lambda_h)^*\Big)\Big)\Big)+d_h\,\Big(2\,q\,(q+2\,\eta)\,\Theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2\,(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+\delta_h^2\,\Big(2\,q\,\eta\,(q+2\,\eta)+k\,\Big(q^2+4\,q\,\eta+2\,\eta^2\Big)+\Big(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\Big)\,(\lambda_h)^*\Big)+2\,\delta_h\,\Big(2\,q\,\eta\,(q+2\,\eta)\,\Theta+k\,\Big(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)\Big)+\Big(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)+k\,\Big(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\Big)\Big)\,(\lambda_h)^*\Big)+\gamma_h\,\Big((q+2\,\eta)\,(4\,q\,\eta\,\Theta+k\,(2\,\eta\,\Theta+q\,(\eta+\Theta)))+(2\,k+q+2\,\eta)\,(2\,\eta\,\Theta+q\,(\eta+\Theta))\,(\lambda_h)^*+\delta_h\,\Big(4\,q\,\eta\,(q+2\,\eta)+k\,\Big(q^2+6\,q\,\eta+4\,\eta^2\Big)+\Big(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\Big)\,(\lambda_h)^*\Big)\Big)\Big)\Big)$$

$$Z^* = U_1 + U_2\,(\lambda_h)^* / ((K_1 + K_2\,(\lambda_h)^*))$$

Thus, all x^*, y^*, z^*, X^*, Y^*, Z^* are positive if $(\lambda_h)^*$, negagive $(\lambda_h)^*$ does not make any sense and not acceptable. To show N_{hH} is always postive :

$N_{hh}^* = x^* + y^* + z^*$

$$
\begin{aligned}
&\Big(\Lambda\,\Big(d_h^5+d_h^4\,(k+2\,q+3\,\eta+2\,\Theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*)+\eta\,\gamma_h^2\,(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+\\
&\quad d_h^3\,\Big(2\,k\,q+q^2+2\,k\,\eta+4\,q\,\eta+2\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+6\,\eta\,\Theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\\
&\qquad (\lambda_h)^*+\Theta\,(\lambda_h)^*+\delta_h\,(2\,(k+2\,q+3\,\eta+\Theta)+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+3\,\eta+\Theta+\delta_h+(\lambda_h)^*)\Big)+\\
&\quad q\,(q+2\,\eta)\,\Big((k+\eta)\,\delta_h^2+(k+\eta)\,\delta_h\,(2\,\Theta+(\lambda_h)^*)+\Theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)\Big)+\\
&\quad \gamma_h\,\Big((q+2\,\eta)\,(2\,q\,\eta+k\,(q+\eta))\,\Theta+(\eta\,(q+2\,\eta)\,(q+\Theta)+k\,(2\,\eta\,\Theta+q\,(\eta+\Theta)))\,(\lambda_h)^*+\\
&\qquad \delta_h\,\Big(2\,q\,\eta\,(q+2\,\eta)+k\,\left(q^2+3\,q\,\eta+\eta^2\right)+(k+\eta)\,(q+\eta)\,(\lambda_h)^*\Big)\Big)+\\
&\quad d_h^2\,\Big(k\,q^2+2\,k\,q\,\eta+q^2\,\eta+2\,q\,\eta^2+4\,k\,q\,\Theta+2\,q^2\,\Theta+5\,k\,\eta\,\Theta+8\,q\,\eta\,\Theta+4\,\eta^2\,\Theta+\\
&\qquad (k+2\,q+3\,\eta)\,\delta_h^2+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+\\
&\qquad 2\,\eta^2\,(\lambda_h)^*+k\,\Theta\,(\lambda_h)^*+2\,q\,\Theta\,(\lambda_h)^*+3\,\eta\,\Theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+3\,\eta+(\lambda_h)^*)+\\
&\qquad \delta_h\,\Big(2\,\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta+k\,(2\,q+2\,\eta+\Theta)\right)+(k+2\,q+3\,\eta)\,(\lambda_h)^*\Big)+\\
&\qquad \gamma_h\,\Big(3\,k\,q+2\,q^2+4\,k\,\eta+8\,q\,\eta+4\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+6\,\eta\,\Theta+\\
&\qquad\quad (2\,k+3\,q+5\,\eta+\Theta)\,(\lambda_h)^*+\delta_h\,(2\,k+4\,q+6\,\eta+(\lambda_h)^*)\Big)\Big)+\\
&\quad d_h\,\Big(2\,k\,q^2\,\Theta+6\,k\,q\,\eta\,\Theta+2\,q^2\,\eta\,\Theta+2\,k\,\eta^2\,\Theta+4\,q\,\eta^2\,\Theta+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\,\delta_h^2+\\
&\qquad k\,q^2\,(\lambda_h)^*+2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+2\,k\,q\,\Theta\,(\lambda_h)^*+\\
&\qquad q^2\,\Theta\,(\lambda_h)^*+2\,k\,\eta\,\Theta\,(\lambda_h)^*+4\,q\,\eta\,\Theta\,(\lambda_h)^*+2\,\eta^2\,\Theta\,(\lambda_h)^*+\\
&\qquad \gamma_h^2\,\left(q^2+4\,q\,\eta+2\,\eta^2+k\,(q+2\,\eta)+(k+q+2\,\eta)\,(\lambda_h)^*\right)+\\
&\qquad \delta_h\,\Big(2\,\left(2\,\eta^2\,\Theta+q^2\,(\eta+\Theta)+2\,q\,\eta\,(\eta+2\,\Theta)+k\,\left(q^2+2\,\eta\,\Theta+2\,q\,(\eta+\Theta)\right)\right)+\\
&\qquad\quad \left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\,(\lambda_h)^*\Big)+\\
&\qquad \gamma_h\,\Big(k\,q^2+3\,k\,q\,\eta+2\,q^2\,\eta+k\,\eta^2+4\,q\,\eta^2+3\,k\,q\,\Theta+2\,q^2\,\Theta+5\,k\,\eta\,\Theta+8\,q\,\eta\,\Theta+\\
&\qquad\quad 4\,\eta^2\,\Theta+\left(q^2+3\,\eta\,(\eta+\Theta)+k\,(2\,q+3\,\eta+\Theta)+q\,(5\,\eta+\Theta)\right)\,(\lambda_h)^*+\\
&\qquad\quad \delta_h\,\left(3\,k\,q+2\,q^2+4\,k\,\eta+8\,q\,\eta+4\,\eta^2+(k+q+2\,\eta)\,(\lambda_h)^*\right)\Big)\Big)\Big)\Big)\Big/\\
&\Big(d_h^6+d_h^5\,(k+2\,q+4\,\eta+2\,\Theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*)+\\
&\quad d_h^4\\
&\qquad \Big(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\\
&\qquad\quad \gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+2\,\Theta\,(\lambda_h)^*+\\
&\qquad\quad 2\,\delta_h\,(k+2\,q+4\,\eta+\Theta+(\lambda_h)^*)+2\,\gamma_h\,(k+2\,q+4\,\eta+\Theta+\delta_h+(\lambda_h)^*)\Big)+\\
&\qquad q\,\delta_h\,((q+2\,\eta)\,(2\,\Theta+\delta_h)\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+\eta\,\gamma_h\,(k\,(q+2\,\eta)+(2\,k+q+2\,\eta)\,(\lambda_h)^*))+\\
&\qquad d_h^3\\
&\qquad\quad \Big(k\,q^2+4\,k\,q\,\eta+2\,q^2\,\eta+2\,k\,\eta^2+4\,q\,\eta^2+4\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+8\,\eta^2\,\Theta+\\
&\qquad\quad 2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+2\,\eta^2\,(\lambda_h)^*+2\,k\,\Theta\,(\lambda_h)^*+\\
&\qquad\quad 4\,q\,\Theta\,(\lambda_h)^*+6\,\eta\,\Theta\,(\lambda_h)^*+\gamma_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\delta_h^2\,(k+2\,q+4\,\eta+(\lambda_h)^*)+\\
&\qquad\quad 2\,\delta_h\,\left(q^2+6\,q\,\eta+4\,\eta^2+2\,q\,\Theta+4\,\eta\,\Theta+k\,(2\,q+3\,\eta+\Theta)+(k+2\,q+3\,\eta+\Theta)\,(\lambda_h)^*\right)+\\
&\qquad\quad \gamma_h\,\Big(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+2\,k\,\Theta+4\,q\,\Theta+8\,\eta\,\Theta+\\
&\qquad\quad\quad (2\,k+3\,q+6\,\eta+2\,\Theta)\,(\lambda_h)^*+2\,\delta_h\,(k+2\,q+4\,\eta+(\lambda_h)^*)\Big)\Big)+\\
&\qquad d_h^2\,\Big(k\,q^2\,\eta+2\,k\,q\,\eta^2+2\,k\,q^2\,\Theta+8\,k\,q\,\eta\,\Theta+4\,q^2\,\eta\,\Theta+4\,k\,\eta^2\,\Theta+8\,q\,\eta^2\,\Theta+k\,q^2\,(\lambda_h)^*+\\
&\qquad\quad 2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+4\,k\,q\,\Theta\,(\lambda_h)^*+2\,q^2\,\Theta\,(\lambda_h)^*+4\,k\,\eta\,\Theta\,(\lambda_h)^*+\\
&\qquad\quad 8\,q\,\eta\,\Theta\,(\lambda_h)^*+4\,\eta^2\,\Theta\,(\lambda_h)^*+\gamma_h^2\,\left(q^2+6\,q\,\eta+4\,\eta^2+k\,(q+3\,\eta)+(k+q+3\,\eta)\,(\lambda_h)^*\right)+\\
&\qquad\quad \delta_h^2\,\left(2\,k\,q+q^2+3\,k\,\eta+6\,q\,\eta+4\,\eta^2+(k+2\,q+3\,\eta)\,(\lambda_h)^*\right)+\\
&\qquad\quad 2\,\delta_h\,\left(2\,q^2\,\eta+4\,q\,\eta^2+q^2\,\Theta+6\,q\,\eta\,\Theta+4\,\eta^2\,\Theta+k\,\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta\right)+\right.\\
&\qquad\quad\quad \left.\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\Theta+3\,\eta\,\Theta+k\,(2\,q+2\,\eta+\Theta)\right)\,(\lambda_h)^*\right)+\\
&\qquad\quad \gamma_h\,\Big(k\,q^2+6\,k\,q\,\eta+4\,q^2\,\eta+4\,k\,\eta^2+8\,q\,\eta^2+3\,k\,q\,\Theta+2\,q^2\,\Theta+6\,k\,\eta\,\Theta+12\,q\,\eta\,\Theta+\\
&\qquad\quad\quad 8\,\eta^2\,\Theta+\left(q^2+6\,q\,\eta+4\,\eta^2+3\,q\,\Theta+6\,\eta\,\Theta+2\,k\,(q+2\,\eta+\Theta)\right)\,(\lambda_h)^*+\\
&\qquad\quad\quad \delta_h\,\left(3\,k\,q+2\,q^2+6\,k\,\eta+12\,q\,\eta+8\,\eta^2+(2\,k+3\,q+6\,\eta)\,(\lambda_h)^*\right)\Big)+
\end{aligned}
$$

$$d_h \left(2\,q\,(q+2\,\eta)\,\theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)+2\,\eta\,\gamma_h^2\,(k\,(q+\eta)+q\,(q+2\,\eta)+(k+q+\eta)\,(\lambda_h)^*)+\right.$$
$$\delta_h^2\left(2\,q\,\eta\,(q+2\,\eta)+k\left(q^2+4\,q\,\eta+2\,\eta^2\right)+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)(\lambda_h)^*\right)+$$
$$2\,\delta_h\left(2\,q\,\eta\,(q+2\,\eta)\,\theta+k\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)\right)+\right.$$
$$\left.\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\,(\eta+2\,\theta)+k\left(q^2+2\,\eta\,\theta+2\,q\,(\eta+\theta)\right)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left((q+2\,\eta)\,(4\,q\,\eta\,\theta+k\,(2\,\eta\,\theta+q\,(\eta+\theta)))+(2\,k+q+2\,\eta)\,(2\,\eta\,\theta+q\,(\eta+\theta))\,(\lambda_h)^*+\right.$$
$$\left.\left.\delta_h\left(4\,q\,\eta\,(q+2\,\eta)+k\left(q^2+6\,q\,\eta+4\,\eta^2\right)+\left(q^2+6\,q\,\eta+4\,\eta^2+2\,k\,(q+2\,\eta)\right)(\lambda_h)^*\right)\right)\right)$$

Now using the definition of λ_v, with y^* and N_{hH}^*

$$\lambda_v^* = b\,\frac{\alpha_{hv}\,y^*}{N_{hH}^*}$$

$$\lambda_v^* =$$
$$\left(\beta_v\left(d_h^4\,(\lambda_h)^*+d_h^3\left(k+2\,q+3\,\eta+\theta+\gamma_h+\delta_h\right)(\lambda_h)^*+d_h^2\left(k\,\eta\,\theta+\left(2\,k\,q+q^2+2\,k\,\eta+4\,q\,\eta+2\,\eta^2+k\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\theta+2\,q\,\theta+3\,\eta\,\theta+\left(k+2\,q+3\,\eta\right)\gamma_h+\left(k+2\,q+3\,\eta\right)\delta_h\right)(\lambda_h)^*\right)+\right.\right.$$
$$d_h\left(2\,k\,\eta\,(q+\eta)\,\theta+\left(k\,q^2+2\,k\,q\,\eta+q^2\,\eta+2\,q\,\eta^2+2\,k\,q\,\theta+q^2\,\theta+2\,k\,\eta\,\theta+4\,q\,\eta\,\theta+2\,\eta^2\,\theta+\right.\right.$$
$$\left.\left.\left(q^2+4\,q\,\eta+2\,\eta^2+k\left(q+2\,\eta\right)\right)\gamma_h+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\delta_h\right)(\lambda_h)^*\right)+$$
$$\left.\left.q\left(k\,\eta\left(q+2\,\eta\right)\theta+\left(\eta\left(k+q+2\,\eta\right)\gamma_h+(k+\eta)\left(q+2\,\eta\right)(\theta+\delta_h)\right)(\lambda_h)^*\right)\right)\right)\Big/$$
$$\left(d_h^5+d_h^4\left(k+2\,q+3\,\eta+2\,\theta+2\,\gamma_h+2\,\delta_h+(\lambda_h)^*\right)+\eta\,\gamma_h^2\left(k\,(q+\eta)+q\left(q+2\,\eta\right)+(k+q+\eta)\,(\lambda_h)^*\right)+\right.$$
$$d_h^3\left(2\,k\,q+q^2+2\,k\,\eta+4\,q\,\eta+2\,\eta^2+2\,k\,\theta+4\,q\,\theta+6\,\eta\,\theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2\,q\,(\lambda_h)^*+3\,\eta\,(\lambda_h)^*+\right.$$
$$\left.\theta\,(\lambda_h)^*+\delta_h\left(2\left(k+2\,q+3\,\eta+\theta\right)+(\lambda_h)^*\right)+2\,\gamma_h\left(k+2\,q+3\,\eta+\theta+\delta_h+(\lambda_h)^*\right)\right)+$$
$$q\left(q+2\,\eta\right)\left((k+\eta)\,\delta_h^2+(k+\eta)\,\delta_h\left(2\,\theta+(\lambda_h)^*\right)+\theta\,(k\,\eta+(k+\eta)\,(\lambda_h)^*)\right)+$$
$$\gamma_h\left(\left(q+2\,\eta\right)\left(2\,q\,\eta+k\,(q+\eta)\right)\theta+\left(\eta\left(q+2\,\eta\right)(q+\theta)+k\left(2\,\eta\,\theta+q\,(\eta+\theta)\right)\right)(\lambda_h)^*+\right.$$
$$\left.\delta_h\left(2\,q\,\eta\left(q+2\,\eta\right)+k\left(q^2+3\,q\,\eta+\eta^2\right)+(k+\eta)\,(q+\eta)\,(\lambda_h)^*\right)\right)+$$
$$d_h^2\left(k\,q^2+2\,k\,q\,\eta+q^2\,\eta+2\,q\,\eta^2+4\,k\,q\,\theta+2\,q^2\,\theta+5\,k\,\eta\,\theta+8\,q\,\eta\,\theta+4\,\eta^2\,\theta+\right.$$
$$\left(k+2\,q+3\,\eta\right)\delta_h^2+2\,k\,q\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2\,k\,\eta\,(\lambda_h)^*+4\,q\,\eta\,(\lambda_h)^*+$$
$$2\,\eta^2\,(\lambda_h)^*+k\,\theta\,(\lambda_h)^*+2\,q\,\theta\,(\lambda_h)^*+3\,\eta\,\theta\,(\lambda_h)^*+\gamma_h^2\left(k+2\,q+3\,\eta+(\lambda_h)^*\right)+$$
$$\delta_h\left(2\left(q^2+4\,q\,\eta+2\,\eta^2+2\,q\,\theta+3\,\eta\,\theta+k\left(2\,q+2\,\eta+\theta\right)\right)+\left(k+2\,q+3\,\eta\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left(3\,k\,q+2\,q^2+4\,k\,\eta+8\,q\,\eta+4\,\eta^2+2\,k\,\theta+4\,q\,\theta+6\,\eta\,\theta+\right.$$
$$\left.\left.\left(2\,k+3\,q+5\,\eta+\theta\right)(\lambda_h)^*+\delta_h\left(2\,k+4\,q+6\,\eta+(\lambda_h)^*\right)\right)\right)+$$
$$d_h\left(2\,k\,q^2\,\theta+6\,k\,q\,\eta\,\theta+2\,q^2\,\eta\,\theta+2\,k\,\eta^2\,\theta+4\,q\,\eta^2\,\theta+\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)\delta_h^2+k\,q^2\right.$$
$$(\lambda_h)^*+2\,k\,q\,\eta\,(\lambda_h)^*+q^2\,\eta\,(\lambda_h)^*+2\,q\,\eta^2\,(\lambda_h)^*+2\,k\,q\,\theta\,(\lambda_h)^*+q^2\,\theta\,(\lambda_h)^*+2\,k\,\eta\,\theta\,(\lambda_h)^*+$$
$$4\,q\,\eta\,\theta\,(\lambda_h)^*+2\,\eta^2\,\theta\,(\lambda_h)^*+\gamma_h^2\left(q^2+4\,q\,\eta+2\,\eta^2+k\left(q+2\,\eta\right)+\left(k+q+2\,\eta\right)(\lambda_h)^*\right)+$$
$$\delta_h\left(2\left(2\,\eta^2\,\theta+q^2\,(\eta+\theta)+2\,q\,\eta\left(\eta+2\,\theta\right)+k\left(q^2+2\,\eta\,\theta+2\,q\,(\eta+\theta)\right)\right)+\right.$$
$$\left.\left(q^2+4\,q\,\eta+2\,\eta^2+2\,k\,(q+\eta)\right)(\lambda_h)^*\right)+$$
$$\gamma_h\left(k\,q^2+3\,k\,q\,\eta+2\,q^2\,\eta+k\,\eta^2+4\,q\,\eta^2+3\,k\,q\,\theta+2\,q^2\,\theta+5\,k\,\eta\,\theta+8\,q\,\eta\,\theta+\right.$$
$$4\,\eta^2\,\theta+\left(q^2+3\,\eta\,(\eta+\theta)+k\left(2\,q+3\,\eta+\theta\right)+q\,(5\,\eta+\theta)\right)(\lambda_h)^*+$$
$$\left.\left.\delta_h\left(3\,k\,q+2\,q^2+4\,k\,\eta+8\,q\,\eta+4\,\eta^2+\left(k+q+2\,\eta\right)(\lambda_h)^*\right)\right)\right)$$

Again from the 7

```
Solve[{λv* * (Nv* - m*) - dv * m* == 0}, {m*}]
```

$$\left\{\left\{m^* \to \frac{(N_v)^*\,(\lambda_v)^*}{d_v+(\lambda_v)^*}\right\}\right\}$$

```
Solve[{ϕ - d_v * N_v* == 0}, {N_v*}]
```

$$\left\{\left\{(N_v)^* \to \frac{\phi}{d_v}\right\}\right\}$$

$$\begin{aligned}
m^* = {} & \Big(\phi\,\beta_v\,\big(d_h^4\,(\lambda_h)^* + d_h^3\,\big(k+2q+3\eta+\theta+\gamma_h+\delta_h\big)\,(\lambda_h)^* + d_h^2\,\big(k\eta\theta + \big(2kq+q^2+2k\eta+4q\eta+2\eta^2+ \\
& k\theta+2q\theta+3\eta\theta+\big(k+2q+3\eta\big)\gamma_h+\big(k+2q+3\eta\big)\delta_h\big)\,(\lambda_h)^*\big) + \\
& d_h\,\big(2k\eta\,(q+\eta)\,\theta+\big(kq^2+2kq\eta+q^2\eta+2q\eta^2+2kq\theta+q^2\theta+2k\eta\theta+4q\eta\theta+2\eta^2\theta+ \\
& \big(q^2+4q\eta+2\eta^2+k\,\big(q+2\eta\big)\big)\gamma_h+\big(q^2+4q\eta+2\eta^2+2k\,(q+\eta)\big)\delta_h\big)\,(\lambda_h)^*\big) + \\
& q\,\big(k\eta\,\big(q+2\eta\big)\theta+\big(\eta\,\big(k+q+2\eta\big)\gamma_h+(k+\eta)\,\big(q+2\eta\big)\,(\theta+\delta_h)\big)\,(\lambda_h)^*\big)\big)\big) / \\
& \Big(d_v\,\big(\beta_v\,\big(d_h^4\,(\lambda_h)^* + d_h^3\,\big(k+2q+3\eta+\theta+\gamma_h+\delta_h\big)\,(\lambda_h)^* + d_h^2\,\big(k\eta\theta+\big(2kq+q^2+2k\eta+4q \\
& \eta+2\eta^2+k\theta+2q\theta+3\eta\theta+\big(k+2q+3\eta\big)\gamma_h+\big(k+2q+3\eta\big)\delta_h\big)\,(\lambda_h)^*\big) + d_h \\
& \big(2k\eta\,(q+\eta)\,\theta+\big(kq^2+2kq\eta+q^2\eta+2q\eta^2+2kq\theta+q^2\theta+2k\eta\theta+4q\eta\theta+2\eta^2\theta+ \\
& \big(q^2+4q\eta+2\eta^2+k\,\big(q+2\eta\big)\big)\gamma_h+\big(q^2+4q\eta+2\eta^2+2k\,(q+\eta)\big)\delta_h\big)\,(\lambda_h)^*\big) + \\
& q\,\big(k\eta\,\big(q+2\eta\big)\theta+\big(\eta\,\big(k+q+2\eta\big)\gamma_h+(k+\eta)\,\big(q+2\eta\big)\,(\theta+\delta_h)\big)\,(\lambda_h)^*\big)\big) + \\
& d_v\,\big(d_h^5+d_h^4\,\big(k+2q+3\eta+2\theta+2\gamma_h+2\delta_h+(\lambda_h)^*\big) + \\
& \eta\,\gamma_h^2\,\big(k\,(q+\eta)+q\,\big(q+2\eta\big)+(k+q+\eta)\,(\lambda_h)^*\big) + d_h^3\,\big(2kq+q^2+2k\eta+4q\eta+ \\
& 2\eta^2+2k\theta+4q\theta+6\eta\theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2q\,(\lambda_h)^*+3\eta\,(\lambda_h)^*+\theta\,(\lambda_h)^*+ \\
& \delta_h\,\big(2\,\big(k+2q+3\eta+\theta\big)+(\lambda_h)^*\big)+2\gamma_h\,\big(k+2q+3\eta+\theta+\delta_h+(\lambda_h)^*\big)\big) + \\
& q\,\big(q+2\eta\big)\,\big((k+\eta)\,\delta_h^2+(k+\eta)\,\delta_h\,\big(2\theta+(\lambda_h)^*\big)+\theta\,(k\eta+(k+\eta)\,(\lambda_h)^*)\big) + \\
& \gamma_h\,\big(\big(q+2\eta\big)\,\big(2q\eta+k\,(q+\eta)\big)\theta+\big(\eta\,\big(q+2\eta\big)\,(q+\theta)+k\,\big(2\eta\theta+q\,(\eta+\theta)\big)\big)\,(\lambda_h)^* + \\
& \delta_h\,\big(2q\eta\,\big(q+2\eta\big)+k\,\big(q^2+3q\eta+\eta^2\big)+(k+\eta)\,(q+\eta)\,(\lambda_h)^*\big)\big) + \\
& d_h^2\,\big(kq^2+2kq\eta+q^2\eta+2q\eta^2+4kq\theta+2q^2\theta+5k\eta\theta+8q\eta\theta+4\eta^2\theta+ \\
& \big(k+2q+3\eta\big)\,\delta_h^2+2kq\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2k\eta\,(\lambda_h)^*+4q\eta\,(\lambda_h)^*+ \\
& 2\eta^2\,(\lambda_h)^*+k\theta\,(\lambda_h)^*+2q\theta\,(\lambda_h)^*+3\eta\theta\,(\lambda_h)^*+\gamma_h^2\,\big(k+2q+3\eta+(\lambda_h)^*\big)+ \\
& \delta_h\,\big(2\,\big(q^2+4q\eta+2\eta^2+2q\theta+3\eta\theta+k\,\big(2q+2\eta+\theta\big)\big)+\big(k+2q+3\eta\big)\,(\lambda_h)^*\big)+ \\
& \gamma_h\,\big(3kq+2q^2+4k\eta+8q\eta+4\eta^2+2k\theta+4q\theta+6\eta\theta+\big(2k+3q+5\eta+\theta\big)\,(\lambda_h)^*+ \\
& \delta_h\,\big(2k+4q+6\eta+(\lambda_h)^*\big)\big)\big)+d_h\,\big(2kq^2\theta+6kq\eta\theta+2q^2\eta\theta+2k\eta^2\theta+ \\
& 4q\eta^2\theta+\big(q^2+4q\eta+2\eta^2+2k\,(q+\eta)\big)\,\delta_h^2+kq^2\,(\lambda_h)^*+2kq\eta\,(\lambda_h)^*+ \\
& q^2\eta\,(\lambda_h)^*+2q\eta^2\,(\lambda_h)^*+2kq\theta\,(\lambda_h)^*+q^2\theta\,(\lambda_h)^*+2k\eta\theta\,(\lambda_h)^*+4q\eta\theta\,(\lambda_h)^*+ \\
& 2\eta^2\theta\,(\lambda_h)^*+\gamma_h^2\,\big(q^2+4q\eta+2\eta^2+k\,\big(q+2\eta\big)+\big(k+q+2\eta\big)\,(\lambda_h)^*\big)+ \\
& \delta_h\,\big(2\,\big(2\eta^2\theta+q^2\,(\eta+\theta)+2q\eta\,\big(\eta+2\theta\big)+k\,\big(q^2+2\eta\theta+2q\,(\eta+\theta)\big)\big)+ \\
& \big(q^2+4q\eta+2\eta^2+2k\,(q+\eta)\big)\,(\lambda_h)^*\big)+ \\
& \gamma_h\,\big(kq^2+3kq\eta+2q^2\eta+k\eta^2+4q\eta^2+3kq\theta+2q^2\theta+5k\eta\theta+8q \\
& \eta\theta+4\eta^2\theta+\big(q^2+3\eta\,(\eta+\theta)+k\,\big(2q+3\eta+\theta\big)+q\,(5\eta+\theta)\big) \\
& (\lambda_h)^*+\delta_h\,\big(3kq+2q^2+4k\eta+8q\eta+4\eta^2+\big(k+q+2\eta\big)\,(\lambda_h)^*\big)\big)\big)\big)\big)
\end{aligned}$$

Now using the definition $\lambda_h{}^* = \frac{\beta_h\, m^*}{N_{hh}{}^*}$ then, it gives a cubic equation-

```
Expand[
 (λ_h)* ((Λ d_v (d_h^5 + d_h^4 (k + 2 q + 3 η + 2 θ + 2 γ_h + 2 δ_h + (λ_h)*) + η γ_h^2 (k (q + η) + q (q + 2 η) +
          (k + q + η) (λ_h)*) + d_h^3 (2 k q + q^2 + 2 k η + 4 q η + 2 η^2 + 2 k θ +
          4 q θ + 6 η θ + γ_h^2 + δ_h^2 + k (λ_h)* + 2 q (λ_h)* + 3 η (λ_h)* + θ (λ_h)* +
          δ_h (2 (k + 2 q + 3 η + θ) + (λ_h)*) + 2 γ_h (k + 2 q + 3 η + θ + δ_h + (λ_h)*)) +
```

$$
\begin{aligned}
&q\,(q+2\eta)\,\left((k+\eta)\,\delta_h^2+(k+\eta)\,\delta_h\,(2\theta+(\lambda_h)^*)+\theta\,(k\eta+(k+\eta)\,(\lambda_h)^*)\right)+\\
&\gamma_h\,\left((q+2\eta)\,(2q\eta+k\,(q+\eta))\,\theta+(\eta\,(q+2\eta)\,(q+\theta)+k\,(2\eta\theta+q\,(\eta+\theta)))\right.\\
&\qquad\left.(\lambda_h)^*+\delta_h\,(2q\eta\,(q+2\eta)+k\,(q^2+3q\eta+\eta^2)+(k+\eta)\,(q+\eta)\,(\lambda_h)^*)\right)+\\
&d_h^2\,(kq^2+2kq\eta+q^2\eta+2q\eta^2+4kq\theta+2q^2\theta+5k\eta\theta+8q\eta\theta+4\eta^2\theta+\\
&\qquad(k+2q+3\eta)\,\delta_h^2+2kq\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2k\eta\,(\lambda_h)^*+4q\eta\,(\lambda_h)^*+\\
&\qquad2\eta^2\,(\lambda_h)^*+k\theta\,(\lambda_h)^*+2q\theta\,(\lambda_h)^*+3\eta\theta\,(\lambda_h)^*+\gamma_h^2\,(k+2q+3\eta+(\lambda_h)^*)+\\
&\qquad\delta_h\,(2\,(q^2+4q\eta+2\eta^2+2q\theta+3\eta\theta+k\,(2q+2\eta+\theta))+(k+2q+3\eta)\,(\lambda_h)^*)+\\
&\qquad\gamma_h\,(3kq+2q^2+4k\eta+8q\eta+4\eta^2+2k\theta+4q\theta+6\eta\theta+\\
&\qquad\qquad(2k+3q+5\eta+\theta)\,(\lambda_h)^*+\delta_h\,(2k+4q+6\eta+(\lambda_h)^*)))+\\
&d_h\,(2kq^2\theta+6kq\eta\theta+2q^2\eta\theta+2k\eta^2\theta+4q\eta^2\theta+\\
&\qquad(q^2+4q\eta+2\eta^2+2k\,(q+\eta))\,\delta_h^2+kq^2\,(\lambda_h)^*+2kq\eta\,(\lambda_h)^*+q^2\eta\,(\lambda_h)^*+\\
&\qquad2q\eta^2\,(\lambda_h)^*+2kq\theta\,(\lambda_h)^*+q^2\theta\,(\lambda_h)^*+2k\eta\theta\,(\lambda_h)^*+4q\eta\theta\,(\lambda_h)^*+\\
&\qquad2\eta^2\theta\,(\lambda_h)^*+\gamma_h^2\,(q^2+4q\eta+2\eta^2+k\,(q+2\eta)+(k+q+2\eta)\,(\lambda_h)^*)+\\
&\qquad\delta_h\,(2\,(2\eta^2\theta+q^2\,(\eta+\theta)+2q\eta\,(\eta+2\theta)+k\,(q^2+2\eta\theta+2q\,(\eta+\theta)))+\\
&\qquad\qquad(q^2+4q\eta+2\eta^2+2k\,(q+\eta))\,(\lambda_h)^*)+\\
&\qquad\gamma_h\,(kq^2+3kq\eta+2q^2\eta+k\eta^2+4q\eta^2+3kq\theta+2q^2\theta+5k\eta\theta+\\
&\qquad\qquad8q\eta\theta+4\eta^2\theta+(q^2+3\eta\,(\eta+\theta)+k\,(2q+3\eta+\theta)+q\,(5\eta+\theta))\,(\lambda_h)^*+\\
&\qquad\qquad\delta_h\,(3kq+2q^2+4k\eta+8q\eta+4\eta^2+(k+q+2\eta)\,(\lambda_h)^*))))\\
&(\beta_v\,(d_h^4\,(\lambda_h)^*+d_h^3\,(k+2q+3\eta+\theta+\gamma_h+\delta_h)\,(\lambda_h)^*+\\
&\qquad d_h^2\,(k\eta\theta+(2kq+q^2+2k\eta+4q\eta+2\eta^2+k\theta+2q\theta+\\
&\qquad\qquad3\eta\theta+(k+2q+3\eta)\,\gamma_h+(k+2q+3\eta)\,\delta_h)\,(\lambda_h)^*)+\\
&\qquad d_h\,(2k\eta\,(q+\eta)\,\theta+(kq^2+2kq\eta+q^2\eta+2q\eta^2+2kq\theta+q^2\theta+\\
&\qquad\qquad2k\eta\theta+4q\eta\theta+2\eta^2\theta+(q^2+4q\eta+2\eta^2+k\,(q+2\eta))\,\gamma_h+\\
&\qquad\qquad(q^2+4q\eta+2\eta^2+2k\,(q+\eta))\,\delta_h)\,(\lambda_h)^*)+\\
&\qquad q\,(k\eta\,(q+2\eta)\,\theta+(\eta\,(k+q+2\eta)\,\gamma_h+(k+\eta)\,(q+2\eta)\,(\theta+\delta_h))\,(\lambda_h)^*))+\\
&\quad d_v\,(d_h^5+d_h^4\,(k+2q+3\eta+2\theta+2\gamma_h+2\delta_h+(\lambda_h)^*)+\\
&\qquad\eta\,\gamma_h^2\,(k\,(q+\eta)+q\,(q+2\eta)+(k+q+\eta)\,(\lambda_h)^*)+d_h^3\,(2kq+q^2+2k\eta+4q\eta+2\\
&\qquad\qquad\eta^2+2k\theta+4q\theta+6\eta\theta+\gamma_h^2+\delta_h^2+k\,(\lambda_h)^*+2q\,(\lambda_h)^*+3\eta\,(\lambda_h)^*+\theta\,(\lambda_h)^*+\\
&\qquad\qquad\delta_h\,(2\,(k+2q+3\eta+\theta)+(\lambda_h)^*)+2\gamma_h\,(k+2q+3\eta+\theta+\delta_h+(\lambda_h)^*))+\\
&\qquad q\,(q+2\eta)\,\left((k+\eta)\,\delta_h^2+(k+\eta)\,\delta_h\,(2\theta+(\lambda_h)^*)+\theta\,(k\eta+(k+\eta)\,(\lambda_h)^*)\right)+\\
&\qquad\gamma_h\,\left((q+2\eta)\,(2q\eta+k\,(q+\eta))\,\theta+(\eta\,(q+2\eta)\,(q+\theta)+k\,(2\eta\theta+q\,(\eta+\theta)))\right.\\
&\qquad\qquad\left.(\lambda_h)^*+\delta_h\,(2q\eta\,(q+2\eta)+k\,(q^2+3q\eta+\eta^2)+(k+\eta)\,(q+\eta)\,(\lambda_h)^*)\right)+\\
&\qquad d_h^2\,(kq^2+2kq\eta+q^2\eta+2q\eta^2+4kq\theta+2q^2\theta+5k\eta\theta+8q\eta\theta+\\
&\qquad\qquad4\eta^2\theta+(k+2q+3\eta)\,\delta_h^2+2kq\,(\lambda_h)^*+q^2\,(\lambda_h)^*+2k\eta\,(\lambda_h)^*+4q\eta\,(\lambda_h)^*+\\
&\qquad\qquad2\eta^2\,(\lambda_h)^*+k\theta\,(\lambda_h)^*+2q\theta\,(\lambda_h)^*+3\eta\theta\,(\lambda_h)^*+\gamma_h^2\,(k+2q+3\eta+(\lambda_h)^*)+\\
&\qquad\qquad\delta_h\,(2\,(q^2+4q\eta+2\eta^2+2q\theta+3\eta\theta+k\,(2q+2\eta+\theta))+\\
&\qquad\qquad\qquad(k+2q+3\eta)\,(\lambda_h)^*)+\gamma_h\,(3kq+2q^2+4k\eta+8q\eta+4\eta^2+2k\theta+\\
&\qquad\qquad\qquad4q\theta+6\eta\theta+(2k+3q+5\eta+\theta)\,(\lambda_h)^*+\delta_h\,(2k+4q+6\eta+(\lambda_h)^*)))+\\
&\qquad d_h\,(2kq^2\theta+6kq\eta\theta+2q^2\eta\theta+2k\eta^2\theta+4q\eta^2\theta+\\
&\qquad\qquad(q^2+4q\eta+2\eta^2+2k\,(q+\eta))\,\delta_h^2+kq^2\,(\lambda_h)^*+2kq\eta\,(\lambda_h)^*+q^2\eta\,(\lambda_h)^*+\\
&\qquad\qquad2q\eta^2\,(\lambda_h)^*+2kq\theta\,(\lambda_h)^*+q^2\theta\,(\lambda_h)^*+2k\eta\theta\,(\lambda_h)^*+4q\eta\theta\,(\lambda_h)^*+\\
&\qquad\qquad2\eta^2\theta\,(\lambda_h)^*+\gamma_h^2\,(q^2+4q\eta+2\eta^2+k\,(q+2\eta)+(k+q+2\eta)\,(\lambda_h)^*)+\\
&\qquad\qquad\delta_h\,(2\,(2\eta^2\theta+q^2\,(\eta+\theta)+2q\eta\,(\eta+2\theta)+k\,(q^2+2\eta\theta+2q\,(\eta+\theta)))+
\end{aligned}
$$

$$
\begin{aligned}
&(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,k\,(q+\eta))\,(\lambda_h)^*) + \\
&\gamma_h\,(k\,q^2 + 3\,k\,q\,\eta + 2\,q^2\,\eta + k\,\eta^2 + 4\,q\,\eta^2 + 3\,k\,q\,\theta + 2\,q^2\,\theta + 5\,k\,\eta\,\theta + 8\,q\,\eta\,\theta + \\
&4\,\eta^2\,\theta + (q^2 + 3\,\eta\,(\eta+\theta) + k\,(2\,q + 3\,\eta + \theta) + q\,(5\,\eta+\theta))\,(\lambda_h)^* + \\
&\delta_h\,(3\,k\,q + 2\,q^2 + 4\,k\,\eta + 8\,q\,\eta + 4\,\eta^2 + (k+q+2\,\eta)\,(\lambda_h)^*)))))) - \\
&((\phi\,\beta_h\,\beta_v\,(d_h^4\,(\lambda_h)^* + d_h^3\,(k + 2\,q + 3\,\eta + \theta + \gamma_h + \delta_h)\,(\lambda_h)^* + \\
&d_h^2\,(k\,\eta\,\theta + (2\,k\,q + q^2 + 2\,k\,\eta + 4\,q\,\eta + 2\,\eta^2 + k\,\theta + 2\,q\,\theta + \\
&3\,\eta\,\theta + (k + 2\,q + 3\,\eta)\,\gamma_h + (k + 2\,q + 3\,\eta)\,\delta_h)\,(\lambda_h)^*) + \\
&d_h\,(2\,k\,\eta\,(q+\eta)\,\theta + (k\,q^2 + 2\,k\,q\,\eta + q^2\,\eta + 2\,q\,\eta^2 + 2\,k\,q\,\theta + q^2\,\theta + 2\,k\,\eta\,\theta + \\
&4\,q\,\eta\,\theta + 2\,\eta^2\,\theta + (q^2 + 4\,q\,\eta + 2\,\eta^2 + k\,(q + 2\,\eta))\,\gamma_h + \\
&(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,k\,(q+\eta))\,\delta_h)\,(\lambda_h)^*) + \\
&q\,(k\,\eta\,(q + 2\,\eta)\,\theta + (\eta\,(k + q + 2\,\eta)\,\gamma_h + (k+\eta)\,(q + 2\,\eta)\,(\theta + \delta_h))\,(\lambda_h)^*)) \\
&(d_h^6 + d_h^5\,(k + 2\,q + 4\,\eta + 2\,\theta + 2\,\gamma_h + 2\,\delta_h + (\lambda_h)^*) + \\
&d_h^4\,(2\,k\,q + q^2 + 3\,k\,\eta + 6\,q\,\eta + 4\,\eta^2 + 2\,k\,\theta + 4\,q\,\theta + 8\,\eta\,\theta + \\
&\gamma_h^2 + \delta_h^2 + k\,(\lambda_h)^* + 2\,q\,(\lambda_h)^* + 3\,\eta\,(\lambda_h)^* + 2\,\theta\,(\lambda_h)^* + \\
&2\,\delta_h\,(k + 2\,q + 4\,\eta + \theta + (\lambda_h)^*) + 2\,\gamma_h\,(k + 2\,q + 4\,\eta + \theta + \delta_h + (\lambda_h)^*)) + \\
&q\,\delta_h\,((q + 2\,\eta)\,(2\,\theta + \delta_h)\,(k\,\eta + (k+\eta)\,(\lambda_h)^*) + \\
&\eta\,\gamma_h\,(k\,(q + 2\,\eta) + (2\,k + q + 2\,\eta)\,(\lambda_h)^*)) + \\
&d_h^3\,(k\,q^2 + 4\,k\,q\,\eta + 2\,q^2\,\eta + 2\,k\,\eta^2 + 4\,q\,\eta^2 + 4\,k\,q\,\theta + 2\,q^2\,\theta + 6\,k\,\eta\,\theta + \\
&12\,q\,\eta\,\theta + 8\,\eta^2\,\theta + 2\,k\,q\,(\lambda_h)^* + q^2\,(\lambda_h)^* + 2\,k\,\eta\,(\lambda_h)^* + \\
&4\,q\,\eta\,(\lambda_h)^* + 2\,\eta^2\,(\lambda_h)^* + 2\,k\,\theta\,(\lambda_h)^* + 4\,q\,\theta\,(\lambda_h)^* + 6\,\eta\,\theta\,(\lambda_h)^* + \\
&\gamma_h^2\,(k + 2\,q + 4\,\eta + (\lambda_h)^*) + \delta_h^2\,(k + 2\,q + 4\,\eta + (\lambda_h)^*) + \\
&2\,\delta_h\,(q^2 + 6\,q\,\eta + 4\,\eta^2 + 2\,q\,\theta + 4\,\eta\,\theta + k\,(2\,q + 3\,\eta + \theta) + (k + 2\,q + 3\,\eta + \theta)\,(\lambda_h)^*) + \\
&\gamma_h\,(3\,k\,q + 2\,q^2 + 6\,k\,\eta + 12\,q\,\eta + 8\,\eta^2 + 2\,k\,\theta + 4\,q\,\theta + 8\,\eta\,\theta + \\
&(2\,k + 3\,q + 6\,\eta + 2\,\theta)\,(\lambda_h)^* + 2\,\delta_h\,(k + 2\,q + 4\,\eta + (\lambda_h)^*))) + \\
&d_h^2\,(k\,q^2\,\eta + 2\,k\,q\,\eta^2 + 2\,k\,q^2\,\theta + 8\,k\,q\,\eta\,\theta + 4\,q^2\,\eta\,\theta + 4\,k\,\eta^2\,\theta + 8\,q\,\eta^2\,\theta + \\
&k\,q^2\,(\lambda_h)^* + 2\,k\,q\,\eta\,(\lambda_h)^* + q^2\,\eta\,(\lambda_h)^* + 2\,q\,\eta^2\,(\lambda_h)^* + 4\,k\,q\,\theta\,(\lambda_h)^* + \\
&2\,q^2\,\theta\,(\lambda_h)^* + 4\,k\,\eta\,\theta\,(\lambda_h)^* + 8\,q\,\eta\,\theta\,(\lambda_h)^* + 4\,\eta^2\,\theta\,(\lambda_h)^* + \\
&\gamma_h^2\,(q^2 + 6\,q\,\eta + 4\,\eta^2 + k\,(q + 3\,\eta) + (k + q + 3\,\eta)\,(\lambda_h)^*) + \\
&\delta_h^2\,(2\,k\,q + q^2 + 3\,k\,\eta + 6\,q\,\eta + 4\,\eta^2 + (k + 2\,q + 3\,\eta)\,(\lambda_h)^*) + \\
&2\,\delta_h\,(2\,q^2\,\eta + 4\,q\,\eta^2 + q^2\,\theta + 6\,q\,\eta\,\theta + 4\,\eta^2\,\theta + k\,(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,q\,\theta + 3\,\eta\,\theta) + \\
&(q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,q\,\theta + 3\,\eta\,\theta + k\,(2\,q + 2\,\eta + \theta))\,(\lambda_h)^*) + \\
&\gamma_h\,(k\,q^2 + 6\,k\,q\,\eta + 4\,q^2\,\eta + 4\,k\,\eta^2 + 8\,q\,\eta^2 + 3\,k\,q\,\theta + 2\,q^2\,\theta + 6\,k\,\eta\,\theta + \\
&12\,q\,\eta\,\theta + 8\,\eta^2\,\theta + (q^2 + 6\,q\,\eta + 4\,\eta^2 + 3\,q\,\theta + 6\,\eta\,\theta + 2\,k\,(q + 2\,\eta + \theta))\,(\lambda_h)^* + \\
&\delta_h\,(3\,k\,q + 2\,q^2 + 6\,k\,\eta + 12\,q\,\eta + 8\,\eta^2 + (2\,k + 3\,q + 6\,\eta)\,(\lambda_h)^*))) + \\
&d_h\,(2\,q\,(q + 2\,\eta)\,\theta\,(k\,\eta + (k+\eta)\,(\lambda_h)^*) + 2\,\eta\,\gamma_h^2 \\
&(k\,(q+\eta) + q\,(q + 2\,\eta) + (k + q + \eta)\,(\lambda_h)^*) + \\
&\delta_h^2\,(2\,q\,\eta\,(q + 2\,\eta) + k\,(q^2 + 4\,q\,\eta + 2\,\eta^2) + (q^2 + 4\,q\,\eta + 2\,\eta^2 + 2\,k\,(q+\eta))\,(\lambda_h)^*) + \\
&2\,\delta_h\,(2\,q\,\eta\,(q + 2\,\eta)\,\theta + k\,(2\,\eta^2\,\theta + q^2\,(\eta+\theta) + 2\,q\,\eta\,(\eta + 2\,\theta)) + \\
&(2\,\eta^2\,\theta + q^2\,(\eta+\theta) + 2\,q\,\eta\,(\eta + 2\,\theta) + k\,(q^2 + 2\,\eta\,\theta + 2\,q\,(\eta+\theta)))\,(\lambda_h)^*) + \\
&\gamma_h\,((q + 2\,\eta)\,(4\,q\,\eta\,\theta + k\,(2\,\eta\,\theta + q\,(\eta+\theta))) + (2\,k + q + 2\,\eta) \\
&(2\,\eta\,\theta + q\,(\eta+\theta))\,(\lambda_h)^* + \delta_h\,(4\,q\,\eta\,(q + 2\,\eta) + k\,(q^2 + 6\,q\,\eta + 4\,\eta^2) + \\
&(q^2 + 6\,q\,\eta + 4\,\eta^2 + 2\,k\,(q + 2\,\eta))\,(\lambda_h)^*)))))]
\end{aligned}
$$

$$\texttt{OutputSizeLimit`Skeleton}[10744] + 6\,k\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\left(\texttt{OutputSizeLimit`Skeleton}[1]^*\right)^3 + 6\,q\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 6\,\eta^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 4\,\eta\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 =$$

poly1 =

$$\texttt{OutputSizeLimit`Skeleton}[10744] + 6\,k\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\left(\texttt{OutputSizeLimit`Skeleton}[1]^*\right)^3 + 6\,q\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 6\,\eta^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 4\,\eta\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3$$

The cubic equation : $a_0\,((\lambda_h)^*)^3 + a_1\,((\lambda_h)^*)^2 + a_2\,((\lambda_h)^*) + a_3 = 0$, where a_0 is postive and a_3 is negative but can not conclude regarding a_1 and a_2. Whatever the sign of a_1 and a_2 the equation has at least one positive root for $(\lambda_h)^*$ and hence positive solution for y^*. So the system do not have disease free equilibrium point. In addition, at leaset one and can have up to three endemic equilibrium point. The coeficients are :

In[7]:=
```
a0 = Coefficient[poly1, (λh)*, 3]
```

Out[7]=

$$k^2\,q^4\,\Theta^2\,\Lambda\,d_v^2 + 4\,k^2\,q^3\,\eta\,\Theta^2\,\Lambda\,d_v^2 + 2\,k\,q^4\,\eta\,\Theta^2\,\Lambda\,d_v^2 + 4\,k^2\,q^2\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + 8\,k\,q^3\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + q^4\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + 8\,k\,q^2\,\eta^3\,\Theta^2\,\Lambda\,d_v^2 + 4\,q^3\,\eta^3\,\Theta^2\,\Lambda\,d_v^2 + 4\,q^2\,\eta^4\,\Theta^2\,\Lambda\,d_v^2 + 2\,k^2\,q^4\,\Theta\,\Lambda\,d_h\,d_v^2 + \texttt{OutputSizeLimit`Skeleton}[1593] + k^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + 4\,k\,q\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + q^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + 6\,k\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + 6\,q\,\eta\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + 6\,\eta^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2 + 2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2 + 4\,\eta\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2$$

In[6]:=

```
a1 = Coefficient[poly1, (λh)*, 2]
```

Out[6]=

$$2\,k^2\,q^4\,\eta\,\Theta^2\,\Lambda\,d_v^2 + 8\,k^2\,q^3\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + 2\,k\,q^4\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + 8\,k^2\,q^2\,\eta^3\,\Theta^2\,\Lambda\,d_v^2 +$$
$$8\,k\,q^3\,\eta^3\,\Theta^2\,\Lambda\,d_v^2 + 8\,k\,q^2\,\eta^4\,\Theta^2\,\Lambda\,d_v^2 + 2\,k^2\,q^4\,\eta\,\Theta\,\Lambda\,d_h\,d_v^2 + 8\,k^2\,q^3\,\eta^2\,\Theta\,\Lambda\,d_h\,d_v^2 +$$
$$2\,k\,q^4\,\eta^2\,\Theta\,\Lambda\,d_h\,d_v^2 + 8\,k^2\,q^2\,\eta^3\,\Theta\,\Lambda\,d_h\,d_v^2 + \texttt{OutputSizeLimit`Skeleton[4243]} +$$
$$12\,k\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h\,\delta_h^3 + 6\,q^2\,\Lambda\,d_h^3\,d_v^2\,\gamma_h\,\delta_h^3 + 16\,k\,\eta\,\Lambda\,d_h^3\,d_v^2\,\gamma_h\,\delta_h^3 + 24\,q\,\eta\,\Lambda\,d_h^3\,d_v^2\,\gamma_h\,\delta_h^3 +$$
$$18\,\eta^2\,\Lambda\,d_h^3\,d_v^2\,\gamma_h\,\delta_h^3 + 4\,k\,\Lambda\,d_h^4\,d_v^2\,\gamma_h\,\delta_h^3 + 6\,q\,\Lambda\,d_h^4\,d_v^2\,\gamma_h\,\delta_h^3 + 10\,\eta\,\Lambda\,d_h^4\,d_v^2\,\gamma_h\,\delta_h^3 + 2\,\Lambda\,d_h^5\,d_v^2\,\gamma_h\,\delta_h^3$$

In[8]:=

```
a2 = Coefficient[poly1, (λh)*, 1]
```

Out[8]=

$$k^2\,q^4\,\eta^2\,\Theta^2\,\Lambda\,d_v^2 + 4\,k^2\,q^3\,\eta^3\,\Theta^2\,\Lambda\,d_v^2 + 4\,k^2\,q^2\,\eta^4\,\Theta^2\,\Lambda\,d_v^2 + 4\,k^2\,q^4\,\eta\,\Theta^2\,\Lambda\,d_h\,d_v^2 +$$
$$20\,k^2\,q^3\,\eta^2\,\Theta^2\,\Lambda\,d_h\,d_v^2 + 4\,k\,q^4\,\eta^2\,\Theta^2\,\Lambda\,d_h\,d_v^2 + 28\,k^2\,q^2\,\eta^3\,\Theta^2\,\Lambda\,d_h\,d_v^2 + 16\,k\,q^3\,\eta^3\,\Theta^2\,\Lambda\,d_h\,d_v^2 +$$
$$8\,k^2\,q\,\eta^4\,\Theta^2\,\Lambda\,d_h\,d_v^2 + 16\,k\,q^2\,\eta^4\,\Theta^2\,\Lambda\,d_h\,d_v^2 + \texttt{OutputSizeLimit`Skeleton[4259]} +$$
$$k^2\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 + 8\,k\,q\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 + 6\,q^2\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 + 10\,k\,\eta\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 + 20\,q\,\eta\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 +$$
$$13\,\eta^2\,\Lambda\,d_h^4\,d_v^2\,\delta_h^4 + 2\,k\,\Lambda\,d_h^5\,d_v^2\,\delta_h^4 + 4\,q\,\Lambda\,d_h^5\,d_v^2\,\delta_h^4 + 6\,\eta\,\Lambda\,d_h^5\,d_v^2\,\delta_h^4 + \Lambda\,d_h^6\,d_v^2\,\delta_h^4$$

In[10]:=

```
a3 = Coefficient[poly1, (λh)*, 0]
```

Out[10]=

$$-2\,k^2\,q^4\,\eta^2\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v - 8\,k^2\,q^3\,\eta^3\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v - 8\,k^2\,q^2\,\eta^4\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v - k^2\,q^4\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v -$$
$$4\,k^2\,q^3\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v - 4\,k^2\,q^2\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v - 2\,k^2\,q^4\,\eta\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v - 16\,k^2\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v -$$
$$4\,k\,q^4\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v - 32\,k^2\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v - 16\,k\,q^3\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v - 16\,k^2\,q\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v -$$
$$16\,k\,q^2\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v - k^2\,q^4\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v - 8\,k^2\,q^3\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v - 2\,k\,q^4\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v -$$
$$16\,k^2\,q^2\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v - 8\,k\,q^3\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v - 8\,k^2\,q\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v - 8\,k\,q^2\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v -$$
$$8\,k^2\,q^3\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 2\,k\,q^4\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 36\,k^2\,q^2\,\eta^2\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 24\,k\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v -$$
$$40\,k^2\,q\,\eta^3\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 56\,k\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 8\,k^2\,\eta^4\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v - 32\,k\,q\,\eta^4\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v -$$
$$4\,k^2\,q^3\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - k\,q^4\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - 18\,k^2\,q^2\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - 12\,k\,q^3\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v -$$
$$20\,k^2\,q\,\eta^3\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - 28\,k\,q^2\,\eta^3\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - 4\,k^2\,\eta^4\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v - 16\,k\,q\,\eta^4\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v -$$
$$12\,k^2\,q^2\,\eta\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 8\,k\,q^3\,\eta\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 32\,k^2\,q\,\eta^2\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 48\,k\,q^2\,\eta^2\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v -$$
$$16\,k^2\,\eta^3\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 64\,k\,q\,\eta^3\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 16\,k\,\eta^4\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v - 6\,k^2\,q^2\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v -$$
$$4\,k\,q^3\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v - 16\,k^2\,q\,\eta^2\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v - 24\,k\,q^2\,\eta^2\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v - 8\,k^2\,\eta^3\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v -$$
$$32\,k\,q\,\eta^3\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v - 8\,k\,\eta^4\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v - 8\,k^2\,q\,\eta\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v - 12\,k\,q^2\,\eta\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v -$$
$$10\,k^2\,\eta^2\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v - 40\,k\,q\,\eta^2\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v - 24\,k\,\eta^3\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v - 4\,k^2\,q\,\eta\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v -$$

$$6\,k\,q^2\,\eta\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v - 5\,k^2\,\eta^2\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v - 20\,k\,q\,\eta^2\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v - 12\,k\,\eta^3\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v -$$
$$2\,k^2\,\eta\,\Theta^2\,\phi\,d_h^6\,\beta_h\,\beta_v - 8\,k\,q\,\eta\,\Theta^2\,\phi\,d_h^6\,\beta_h\,\beta_v - 12\,k\,\eta^2\,\Theta^2\,\phi\,d_h^6\,\beta_h\,\beta_v - k^2\,\eta\,\Theta\,\phi\,d_h^7\,\beta_h\,\beta_v -$$
$$4\,k\,q\,\eta\,\Theta\,\phi\,d_h^7\,\beta_h\,\beta_v - 6\,k\,\eta^2\,\Theta\,\phi\,d_h^7\,\beta_h\,\beta_v - 2\,k\,\eta\,\Theta^2\,\phi\,d_h^7\,\beta_h\,\beta_v - k\,\eta\,\Theta\,\phi\,d_h^8\,\beta_h\,\beta_v -$$
$$k^2\,q^4\,\eta^2\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 4\,k^2\,q^3\,\eta^3\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 4\,k^2\,q^2\,\eta^4\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - k^2\,q^4\,\eta\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h -$$
$$6\,k^2\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 4\,k\,q^4\,\eta^2\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 12\,k^2\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h -$$
$$16\,k\,q^3\,\eta^3\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 8\,k^2\,q\,\eta^4\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h - 16\,k\,q^2\,\eta^4\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h -$$
$$k^2\,q^4\,\eta\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 10\,k^2\,q^3\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 4\,k\,q^4\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h -$$
$$22\,k^2\,q^2\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 16\,k\,q^3\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 12\,k^2\,q\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h -$$
$$16\,k\,q^2\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 5\,k^2\,q^3\,\eta\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 2\,k\,q^4\,\eta\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h -$$
$$22\,k^2\,q^2\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 24\,k\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 28\,k^2\,q\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h -$$
$$56\,k\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 8\,k^2\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h - 32\,k\,q\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h -$$
$$5\,k^2\,q^3\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 2\,k\,q^4\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 27\,k^2\,q^2\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h -$$
$$24\,k\,q^3\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 34\,k^2\,q\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 56\,k\,q^2\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h -$$
$$8\,k^2\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 32\,k\,q\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 9\,k^2\,q^2\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 8\,k\,q^3\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h -$$
$$26\,k^2\,q\,\eta^2\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 48\,k\,q^2\,\eta^2\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 16\,k^2\,\eta^3\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h -$$
$$64\,k\,q\,\eta^3\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 16\,k\,\eta^4\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h - 9\,k^2\,q^2\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h -$$
$$8\,k\,q^3\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 28\,k^2\,q\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 48\,k\,q^2\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h -$$
$$16\,k^2\,\eta^3\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 64\,k\,q\,\eta^3\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 16\,k\,\eta^4\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 7\,k^2\,q\,\eta\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h -$$
$$12\,k\,q^2\,\eta\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 10\,k^2\,\eta^2\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 40\,k\,q\,\eta^2\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h -$$
$$24\,k\,\eta^3\,\Theta^2\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h - 7\,k^2\,q\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 12\,k\,q^2\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 10\,k^2\,\eta^2\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h -$$
$$40\,k\,q\,\eta^2\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 24\,k\,\eta^3\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 2\,k^2\,\eta\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 8\,k\,q\,\eta\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h -$$
$$12\,k\,\eta^2\,\Theta^2\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h - 2\,k^2\,\eta\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v\,\gamma_h - 8\,k\,q\,\eta\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v\,\gamma_h - 12\,k\,\eta^2\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v\,\gamma_h -$$
$$2\,k\,\eta\,\Theta^2\,\phi\,d_h^6\,\beta_h\,\beta_v\,\gamma_h - 2\,k\,\eta\,\Theta\,\phi\,d_h^7\,\beta_h\,\beta_v\,\gamma_h - 2\,k^2\,q^3\,\eta^2\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 - 2\,k\,q^4\,\eta^2\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$6\,k^2\,q^2\,\eta^3\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 - 8\,k\,q^3\,\eta^3\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 - 4\,k^2\,q\,\eta^4\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$8\,k\,q^2\,\eta^4\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h^2 - k^2\,q^3\,\eta\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - k\,q^4\,\eta\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - 9\,k^2\,q^2\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$12\,k\,q^3\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - 14\,k^2\,q\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - 28\,k\,q^2\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$4\,k^2\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - 16\,k\,q\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h^2 - 3\,k^2\,q^2\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 - 4\,k\,q^3\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$12\,k^2\,q\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 - 24\,k\,q^2\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 - 8\,k^2\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$32\,k\,q\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 - 8\,k\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\gamma_h^2 - 3\,k^2\,q\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h^2 - 6\,k\,q^2\,\eta\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$5\,k^2\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h^2 - 20\,k\,q\,\eta^2\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h^2 - 12\,k\,\eta^3\,\Theta\,\phi\,d_h^4\,\beta_h\,\beta_v\,\gamma_h^2 - k^2\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h^2 -$$
$$4\,k\,q\,\eta\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h^2 - 6\,k\,\eta^2\,\Theta\,\phi\,d_h^5\,\beta_h\,\beta_v\,\gamma_h^2 - k\,\eta\,\Theta\,\phi\,d_h^6\,\beta_h\,\beta_v\,\gamma_h^2 - 2\,k^2\,q^4\,\eta^2\,\Theta^2\,\phi\,\beta_h\,\beta_v\,\delta_h -$$
$$8\,k^2\,q^3\,\eta^3\,\Theta^2\,\phi\,\beta_h\,\beta_v\,\delta_h - 8\,k^2\,q^2\,\eta^4\,\Theta^2\,\phi\,\beta_h\,\beta_v\,\delta_h - 2\,k^2\,q^4\,\eta^2\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 8\,k^2\,q^3\,\eta^3\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h -$$
$$8\,k^2\,q^2\,\eta^4\,\Theta\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 2\,k^2\,q^4\,\eta\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 16\,k^2\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h -$$
$$4\,k\,q^4\,\eta^2\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 32\,k^2\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 16\,k\,q^3\,\eta^3\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h -$$
$$16\,k^2\,q\,\eta^4\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 16\,k\,q^2\,\eta^4\,\Theta^2\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - 2\,k^2\,q^4\,\eta\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h -$$
$$16\,k^2\,q^3\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 4\,k\,q^4\,\eta^2\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 32\,k^2\,q^2\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h -$$
$$16\,k\,q^3\,\eta^3\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 16\,k^2\,q\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 16\,k\,q^2\,\eta^4\,\Theta\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h -$$
$$8\,k^2\,q^3\,\eta\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 2\,k\,q^4\,\eta\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 36\,k^2\,q^2\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h -$$
$$24\,k\,q^3\,\eta^2\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 40\,k^2\,q\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 56\,k\,q^2\,\eta^3\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h -$$
$$8\,k^2\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 32\,k\,q\,\eta^4\,\Theta^2\,\phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h - 8\,k^2\,q^3\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h -$$
$$2\,k\,q^4\,\eta\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 36\,k^2\,q^2\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 24\,k\,q^3\,\eta^2\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h -$$
$$40\,k^2\,q\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 56\,k\,q^2\,\eta^3\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 8\,k^2\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h -$$
$$32\,k\,q\,\eta^4\,\Theta\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 12\,k^2\,q^2\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h - 8\,k\,q^3\,\eta\,\Theta^2\,\phi\,d_h^3\,\beta_h\,\beta_v\,\delta_h -$$

$$32 k^2 q \eta^2 \Theta^2 \phi d_h^3 \beta_h \beta_v \delta_h - 48 k q^2 \eta^2 \Theta^2 \phi d_h^3 \beta_h \beta_v \delta_h - 16 k^2 \eta^3 \Theta^2 \phi d_h^3 \beta_h \beta_v \delta_h -$$
$$64 k q \eta^3 \Theta^2 \phi d_h^3 \beta_h \beta_v \delta_h - 16 k \eta^4 \Theta^2 \phi d_h^3 \beta_h \beta_v \delta_h - 12 k^2 q^2 \eta \Theta \phi d_h^4 \beta_h \beta_v \delta_h -$$
$$8 k q^3 \eta \Theta \phi d_h^4 \beta_h \beta_v \delta_h - 32 k^2 q \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \delta_h - 48 k q^2 \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \delta_h -$$
$$16 k^2 \eta^3 \Theta \phi d_h^4 \beta_h \beta_v \delta_h - 64 k q \eta^3 \Theta \phi d_h^4 \beta_h \beta_v \delta_h - 16 k \eta^4 \Theta \phi d_h^4 \beta_h \beta_v \delta_h - 8 k^2 q \eta \Theta^2 \phi d_h^4 \beta_h \beta_v \delta_h -$$
$$12 k q^2 \eta \Theta^2 \phi d_h^4 \beta_h \beta_v \delta_h - 10 k^2 \eta^2 \Theta^2 \phi d_h^4 \beta_h \beta_v \delta_h - 40 k q \eta^2 \Theta^2 \phi d_h^4 \beta_h \beta_v \delta_h -$$
$$24 k \eta^3 \Theta^2 \phi d_h^4 \beta_h \beta_v \delta_h - 8 k^2 q \eta \Theta \phi d_h^5 \beta_h \beta_v \delta_h - 12 k q^2 \eta \Theta \phi d_h^5 \beta_h \beta_v \delta_h -$$
$$10 k^2 \eta^2 \Theta \phi d_h^5 \beta_h \beta_v \delta_h - 40 k q \eta^2 \Theta \phi d_h^5 \beta_h \beta_v \delta_h - 24 k \eta^3 \Theta \phi d_h^5 \beta_h \beta_v \delta_h - 2 k^2 \eta \Theta^2 \phi d_h^5 \beta_h \beta_v \delta_h -$$
$$8 k q \eta \Theta^2 \phi d_h^5 \beta_h \beta_v \delta_h - 12 k \eta^2 \Theta^2 \phi d_h^5 \beta_h \beta_v \delta_h - 2 k^2 \eta \Theta \phi d_h^6 \beta_h \beta_v \delta_h - 8 k q \eta \Theta \phi d_h^6 \beta_h \beta_v \delta_h -$$
$$12 k \eta^2 \Theta \phi d_h^6 \beta_h \beta_v \delta_h - 2 k \eta \Theta^2 \phi d_h^6 \beta_h \beta_v \delta_h - 2 k \eta \Theta \phi d_h^7 \beta_h \beta_v \delta_h - k^2 q^4 \eta^2 \Theta \phi \beta_h \beta_v \gamma_h \delta_h -$$
$$4 k^2 q^3 \eta^3 \Theta \phi \beta_h \beta_v \gamma_h \delta_h - 4 k^2 q^2 \eta^4 \Theta \phi \beta_h \beta_v \gamma_h \delta_h - k^2 q^4 \eta \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h -$$
$$10 k^2 q^3 \eta^2 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h - 4 k q^4 \eta^2 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h - 22 k^2 q^2 \eta^3 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h -$$
$$16 k q^3 \eta^3 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h - 12 k^2 q \eta^4 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h - 16 k q^2 \eta^4 \Theta \phi d_h \beta_h \beta_v \gamma_h \delta_h -$$
$$5 k^2 q^3 \eta \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 2 k q^4 \eta \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 27 k^2 q^2 \eta^2 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h -$$
$$24 k q^3 \eta^2 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 34 k^2 q \eta^3 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 56 k q^2 \eta^3 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h -$$
$$8 k^2 \eta^4 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 32 k q \eta^4 \Theta \phi d_h^2 \beta_h \beta_v \gamma_h \delta_h - 9 k^2 q^2 \eta \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h -$$
$$8 k q^3 \eta \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h - 28 k^2 q \eta^2 \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h - 48 k q^2 \eta^2 \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h -$$
$$16 k^2 \eta^3 \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h - 64 k q \eta^3 \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h - 16 k \eta^4 \Theta \phi d_h^3 \beta_h \beta_v \gamma_h \delta_h -$$
$$7 k^2 q \eta \Theta \phi d_h^4 \beta_h \beta_v \gamma_h \delta_h - 12 k q^2 \eta \Theta \phi d_h^4 \beta_h \beta_v \gamma_h \delta_h - 10 k^2 \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \gamma_h \delta_h -$$
$$40 k q \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \gamma_h \delta_h - 24 k \eta^3 \Theta \phi d_h^4 \beta_h \beta_v \gamma_h \delta_h - 2 k^2 \eta \Theta \phi d_h^5 \beta_h \beta_v \gamma_h \delta_h -$$
$$8 k q \eta \Theta \phi d_h^5 \beta_h \beta_v \gamma_h \delta_h - 12 k \eta^2 \Theta \phi d_h^5 \beta_h \beta_v \gamma_h \delta_h - 2 k \eta \Theta \phi d_h^6 \beta_h \beta_v \gamma_h \delta_h - k^2 q^4 \eta^2 \Theta \phi \beta_h \beta_v \delta_h^2 -$$
$$4 k^2 q^3 \eta^3 \Theta \phi \beta_h \beta_v \delta_h^2 - 4 k^2 q^2 \eta^4 \Theta \phi \beta_h \beta_v \delta_h^2 - k^2 q^4 \eta \Theta \phi d_h \beta_h \beta_v \delta_h^2 - 8 k^2 q^3 \eta^2 \Theta \phi d_h \beta_h \beta_v \delta_h^2 -$$
$$2 k q^4 \eta^2 \Theta \phi d_h \beta_h \beta_v \delta_h^2 - 16 k^2 q^2 \eta^3 \Theta \phi d_h \beta_h \beta_v \delta_h^2 - 8 k q^3 \eta^3 \Theta \phi d_h \beta_h \beta_v \delta_h^2 -$$
$$8 k^2 q \eta^4 \Theta \phi d_h \beta_h \beta_v \delta_h^2 - 8 k q^2 \eta^4 \Theta \phi d_h \beta_h \beta_v \delta_h^2 - 4 k^2 q^3 \eta \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - k q^4 \eta \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 -$$
$$18 k^2 q^2 \eta^2 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - 12 k q^3 \eta^2 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - 20 k^2 q \eta^3 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 -$$
$$28 k q^2 \eta^3 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - 4 k^2 \eta^4 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - 16 k q \eta^4 \Theta \phi d_h^2 \beta_h \beta_v \delta_h^2 - 6 k^2 q^2 \eta \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 -$$
$$4 k q^3 \eta \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 - 16 k^2 q \eta^2 \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 - 24 k q^2 \eta^2 \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 -$$
$$8 k^2 \eta^3 \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 - 32 k q \eta^3 \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 - 8 k \eta^4 \Theta \phi d_h^3 \beta_h \beta_v \delta_h^2 - 4 k^2 q \eta \Theta \phi d_h^4 \beta_h \beta_v \delta_h^2 -$$
$$6 k q^2 \eta \Theta \phi d_h^4 \beta_h \beta_v \delta_h^2 - 5 k^2 \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \delta_h^2 - 20 k q \eta^2 \Theta \phi d_h^4 \beta_h \beta_v \delta_h^2 - 12 k \eta^3 \Theta \phi d_h^4 \beta_h \beta_v \delta_h^2 -$$
$$k^2 \eta \Theta \phi d_h^5 \beta_h \beta_v \delta_h^2 - 4 k q \eta \Theta \phi d_h^5 \beta_h \beta_v \delta_h^2 - 6 k \eta^2 \Theta \phi d_h^5 \beta_h \beta_v \delta_h^2 - k \eta \Theta \phi d_h^6 \beta_h \beta_v \delta_h^2$$

Now we will proceed with three control strategies.

Case-I: Absence of cross border mobility i.e η=0, θ=0. Then the reduced quadratic equation:

In[11]:=
```
Coefficient[poly1, η, 0]
```

In[12]:= **poly2 =**

$$4\,k^2\,q^4\,\Theta^2\,\Lambda\,d_h^2\,d_v^2\,(\lambda_h)^* + 4\,k^2\,q^4\,\Theta\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* + 16\,k^2\,q^3\,\Theta^2\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* +$$
$$8\,k\,q^4\,\Theta^2\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* + k^2\,q^4\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* + 16\,k^2\,q^3\,\Theta\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* +$$
$$8\,k\,q^4\,\Theta\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* + \texttt{OutputSizeLimit`Skeleton}[\,2664\,] +$$
$$k^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 4\,k\,q\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + q^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 +$$
$$2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3$$

Out[12]=

$$4\,k^2\,q^4\,\Theta^2\,\Lambda\,d_h^2\,d_v^2\,(\lambda_h)^* + 4\,k^2\,q^4\,\Theta\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* + 16\,k^2\,q^3\,\Theta^2\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* +$$
$$8\,k\,q^4\,\Theta^2\,\Lambda\,d_h^3\,d_v^2\,(\lambda_h)^* + k^2\,q^4\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* + 16\,k^2\,q^3\,\Theta\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* +$$
$$8\,k\,q^4\,\Theta\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* + \texttt{OutputSizeLimit`Skeleton}[\,2664\,] +$$
$$k^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 4\,k\,q\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + q^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 +$$
$$2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3$$

In[13]:=

```
Coefficient[poly2, Θ, 0]
```

In[14]:= **poly3 =**

$$k^2\,q^4\,\Lambda\,d_h^4\,d_v^2\,(\lambda_h)^* + 4\,k^2\,q^3\,\Lambda\,d_h^5\,d_v^2\,(\lambda_h)^* + 2\,k\,q^4\,\Lambda\,d_h^5\,d_v^2\,(\lambda_h)^* + 6\,k^2\,q^2\,\Lambda\,d_h^6\,d_v^2\,(\lambda_h)^* +$$
$$8\,k\,q^3\,\Lambda\,d_h^6\,d_v^2\,(\lambda_h)^* + q^4\,\Lambda\,d_h^6\,d_v^2\,(\lambda_h)^* + 4\,k^2\,q\,\Lambda\,d_h^7\,d_v^2\,(\lambda_h)^* + 12\,k\,q^2\,\Lambda\,d_h^7\,d_v^2\,(\lambda_h)^* +$$
$$\texttt{OutputSizeLimit`Skeleton}[\,1356\,] + 2\,k\,q^2\,\Lambda\,d_h\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 +$$
$$k^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 4\,k\,q\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + q^2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 +$$
$$2\,k\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + 2\,q\,\Lambda\,d_h^3\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3 + \Lambda\,d_h^4\,d_v^2\,\gamma_h^2\,\delta_h^2\,((\lambda_h)^*)^3$$

$$k^2 q^4 \Lambda d_h^4 d_v^2 (\lambda_h)^* + 4 k^2 q^3 \Lambda d_h^5 d_v^2 (\lambda_h)^* + 2 k q^4 \Lambda d_h^5 d_v^2 (\lambda_h)^* + 6 k^2 q^2 \Lambda d_h^6 d_v^2 (\lambda_h)^* + 8 k q^3 \Lambda d_h^6 d_v^2 (\lambda_h)^* + q^4 \Lambda d_h^6 d_v^2 (\lambda_h)^* + 4 k^2 q \Lambda d_h^7 d_v^2 (\lambda_h)^* + 12 k q^2 \Lambda d_h^7 d_v^2 (\lambda_h)^* +$$

OutputSizeLimit`Skeleton[1356]

$$+ 2 k q^2 \Lambda d_h d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + k^2 \Lambda d_h^2 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + 4 k q \Lambda d_h^2 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + q^2 \Lambda d_h^2 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + 2 k \Lambda d_h^3 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + 2 q \Lambda d_h^3 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3 + \Lambda d_h^4 d_v^2 \gamma_h^2 \delta_h^2 ((\lambda_h)^*)^3$$

$A_0 ((\lambda_h)^*)^3 + A_1 ((\lambda_h)^*)^2 + A_2 (\lambda_h)^* = 0$, where a_0 reduced A_0, a_1 reduced to A_1 and a_2 to A_2

Here $(\lambda_h)^* = 0$ gives the disease free equilibrium point :

$E_0 = (x^*, y^*, z^*, X^*, Y^*, Z^*, l^*, m^*) =$

$(\Lambda / d_h, 0, 0, 0, 0, 0, \phi / d_v, 0)$. The corresponding epidemic index can be obtained using next generation matrix method.

$$I_{hH}' = b \frac{\alpha_{vh} I_{vH}}{N_{hH}} * S_{hH} + \theta * I_{hM} - (p + d_h + \delta_h + \gamma_h) * I_{hH}$$

$$I_{hA}' = k * S_{hA} + \theta * I_{hH} - (\theta + d_h + \delta_h + \gamma_h) * I_{hA}$$

$$I_{vH}' = b \frac{\alpha_{hv} I_{hH}}{N_{hH}} * S_{vH} - d_v * I_{vH}$$

In[8]:=
```
D[{(βh * m)/(x + y + z) * x, k * ShA, (βv * y)/(x + y + z) * l}, {{y, Y, m}}]
```

In[9]:=
```
MatrixForm[{{{-(m x βh)/(x + y + z)^2, 0, (x βh)/(x + y + z)}, {0, 0, 0}, {-(l y βv)/(x + y + z)^2 + (l βv)/(x + y + z), 0, 0}}]
```

In[16]:=
```
F = {{0, 0, βh}, {0, 0, 0}, {(ϕ/dv βv)/(Λ/dh), 0, 0}}
```

Out[16]=
$$\left\{\{0, 0, \beta_h\}, \{0, 0, 0\}, \left\{\frac{\phi\, d_h\, \beta_v}{\Lambda\, d_v}, 0, 0\right\}\right\}$$

In[10]:=
```
D[{-(p + dh + δh + γh) * y, θ * y - (θ + dh + δh + γh) * Y, -dv * m}, {{y, Y, m}}]
```

```
MatrixForm[{{-dh - γh - δh, 0, 0}, {0, -dh - γh - δh, 0}, {0, 0, -dv}}]
```

In[14]:=
```
Inverse[{{-dh - γh - δh, 0, 0}, {0, -dh - γh - δh, 0}, {0, 0, -dv}}]
```

In[15]:= $V_{in} = \left\{\left\{-\frac{d_h\, d_v + d_v\, \gamma_h + d_v\, \delta_h}{d_v\, (-d_h - \gamma_h - \delta_h)^2}, 0, 0\right\}, \left\{0, -\frac{d_h\, d_v + d_v\, \gamma_h + d_v\, \delta_h}{d_v\, (-d_h - \gamma_h - \delta_h)^2}, 0\right\}, \left\{0, 0, -\frac{1}{d_v}\right\}\right\}$

Out[15]= $\left\{\left\{-\frac{d_h\, d_v + d_v\, \gamma_h + d_v\, \delta_h}{d_v\, (-d_h - \gamma_h - \delta_h)^2}, 0, 0\right\}, \left\{0, -\frac{d_h\, d_v + d_v\, \gamma_h + d_v\, \delta_h}{d_v\, (-d_h - \gamma_h - \delta_h)^2}, 0\right\}, \left\{0, 0, -\frac{1}{d_v}\right\}\right\}$

In[17]:= $F.V_{in}$

Case - II with the control strategies, k = 0

In[18]:= $\text{Eigenvalues}\left[\left\{\left\{0, 0, -\frac{\beta_h}{d_v}\right\}, \{0, 0, 0\}, \left\{-\frac{\phi\, d_h\, \beta_v\, (d_h\, d_v + d_v\, \gamma_h + d_v\, \delta_h)}{\Lambda\, d_v^2\, (-d_h - \gamma_h - \delta_h)^2}, 0, 0\right\}\right\}\right]$

Out[18]= $\left\{0, -\frac{\sqrt{\phi}\ \sqrt{d_h}\ \sqrt{\beta_h}\ \sqrt{\beta_v}}{\sqrt{\Lambda}\ d_v\ \sqrt{d_h + \gamma_h + \delta_h}}, \frac{\sqrt{\phi}\ \sqrt{d_h}\ \sqrt{\beta_h}\ \sqrt{\beta_v}}{\sqrt{\Lambda}\ d_v\ \sqrt{d_h + \gamma_h + \delta_h}}\right\}$

$$R_0 = \sqrt{\frac{\beta_v\, \beta_h\, \phi\, d_h}{\Lambda d_v^2\, (d_h + \gamma_h + \delta_h)}}$$

$$R_0^2\, \Lambda d_v^2\, (d_h + \gamma_h + \delta_h) = \beta_v\, \beta_h\, \phi\, d_h$$

Local stability of DFE E_0 : Jacobian of the system at the disease free equilibrium point

$$J_0 = \begin{pmatrix} -d_h & 0 & q & 0 & -\beta_h & 0 & 0 & 0 \\ 0 & -d_h - \gamma_h - \delta_h & 0 & 0 & \beta_h & 0 & 0 & 0 \\ 0 & \gamma_h & -q - d_h & 0 & 0 & 0 & 0 & 0 \\ 0 & -\frac{\phi\, d_h\, \beta_h}{\Lambda} & 0 & -d_v & 0 & 0 & 0 & 0 \\ 0 & \frac{\phi\, d_h\, \beta_h}{\Lambda} & 0 & 0 & -d_v & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -k - d_h & 0 & q \\ 0 & 0 & 0 & 0 & 0 & k & -d_h - \gamma_h - \delta_h & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & \gamma_h & -q - d_h \end{pmatrix}$$

$$J_H = \begin{pmatrix} -d_h & 0 & q & 0 & -\beta_h \\ 0 & -d_h - \gamma_h - \delta_h & 0 & 0 & \beta_h \\ 0 & \gamma_h & -q - d_h & 0 & 0 \\ 0 & -\frac{\phi\, d_h\, \beta_v}{\Lambda} & 0 & -d_v & 0 \\ 0 & \frac{\phi\, d_h\, \beta_v}{\Lambda} & 0 & 0 & -d_v \end{pmatrix}$$

Eigenvalues are :

$$-d_h,\ -q - d_h,\ -d_v,$$

$$\frac{1}{2}\left(-(d_h + d_v + \gamma_h + \delta_h) - \sqrt{\left((d_h + d_v + \gamma_h + \delta_h)^2 - 4\, d_v\, (d_h + \delta_h + \gamma_h)\, \left(1 - R_0^2\right)\right)}\right)$$

$$\frac{1}{2}\left(-(d_h + d_v + \gamma_h + \delta_h) - \sqrt{\left((d_h + d_v + \gamma_h + \delta_h)^2 - 4\, d_v\, (d_h + \delta_h + \gamma_h)\, \left(1 - R_0^2\right)\right)}\right)$$

$$J_A = \begin{pmatrix} -k - d_h - \lambda & 0 & q \\ k & -d_h - \gamma_h - \delta_h - \lambda & 0 \\ 0 & \gamma_h & -\lambda - q - d_h \end{pmatrix}$$

Characteristic polynomialequation :

$$\lambda^3 + e_1 \lambda^2 + e_2 \lambda + e_3 = 0$$

where, $e_0 = 1$, $e_1 = \left(k + q + 3 d_h + \gamma_h + \delta_h\right)$,

$e_2 = \left(k q + 2 k d_h + 2 q d_h + 3 d_h^2 + k \gamma_h + q \gamma_h + 2 d_h \gamma_h + k \delta_h + q \delta_h + 2 d_h \delta_h\right)$,

$e_3 = \left(k q d_h + k d_h^2 + q d_h^2 + d_h^3 + k d_h \gamma_h + q d_h \gamma_h + d_h^2 \gamma_h + k q \delta_h + k d_h \delta_h + q d_h \delta_h + d_h^2 \delta_h\right)$

$e_1 e_2 - e_3 = k^2 q + k q^2 + 2 k^2 d_h + 6 k q d_h + 2 q^2 d_h + 8 k d_h^2 + 8 q d_h^2 + 8 d_h^3 + k^2 \gamma_h + 3 k q \gamma_h +$
$q^2 \gamma_h + 6 k d_h \gamma_h + 6 q d_h \gamma_h + 8 d_h^2 \gamma_h + k \gamma_h^2 + q \gamma_h^2 + 2 d_h \gamma_h^2 + k^2 \delta_h + 2 k q \delta_h + q^2 \delta_h +$
$6 k d_h \delta_h + 6 q d_h \delta_h + 8 d_h^2 \delta_h + 2 k \gamma_h \delta_h + 2 q \gamma_h \delta_h + 4 d_h \gamma_h \delta_h + k \delta_h^2 + q \delta_h^2 + 2 d_h \delta_h^2 >$
0. Thus every eigen values of J_H are with negative real
part for $R_0 < 1$ and using Hurwitz theorem,
each eigen values of J_A are with negative real part.

Now reduced quadratic equation : $A_0 \left((\lambda_h)^*\right)^2 + A_1 \left((\lambda_h)^*\right) + A_2 = 0$,

$$A_0 = \Lambda d_v (q + d_h + \gamma_h) \left((q + d_h) \beta_v + d_v (q + d_h + \gamma_h)\right)$$
$$\left(d_h^3 + k q \delta_h + d_h^2 (k + q + \gamma_h + \delta_h) + d_h (k q + (k + q) \gamma_h + (k + q) \delta_h)\right)^2$$

$$A_1 = (q + d_h) \left(d_h^3 + k q \delta_h + d_h^2 (k + q + \gamma_h + \delta_h) + d_h (k q + (k + q) \gamma_h + (k + q) \delta_h)\right)^2$$
$$\left(d_h^2 \left(2 \Lambda d_v^2 + \Lambda d_v \beta_v - \phi \beta_h \beta_v\right) - q \phi \beta_h \beta_v \delta_h + q \Lambda d_v \beta_v (\gamma_h + \delta_h) + 2 \Lambda d_v^2 (q + \gamma_h) (\gamma_h + \delta_h) +\right.$$
$$\left. d_h \left(\Lambda d_v \beta_v (q + \gamma_h + \delta_h) - \phi \beta_h \beta_v (q + \gamma_h + \delta_h) + 2 \Lambda d_v^2 \left(q + 2 \gamma_h + \delta_h\right)\right)\right)$$

$$A_2 = (q + d_h)^2 (d_h + \gamma_h + \delta_h) \left(d_h \left(\Lambda d_v^2 - \phi \beta_h \beta_v\right) + \Lambda d_v^2 (\gamma_h + \delta_h)\right)$$
$$\left(d_h^3 + k q \delta_h + d_h^2 (k + q + \gamma_h + \delta_h) + d_h (k q + (k + q) \gamma_h + (k + q) \delta_h)\right)^2$$
$$= (q + d_h)^2 (d_h + \gamma_h + \delta_h)^2 \Lambda d_v^2 \left(1 - R_0^2\right)$$
$$\left(d_h^3 + k q \delta_h + d_h^2 (k + q + \gamma_h + \delta_h) + d_h (k q + (k + q) \gamma_h + (k + q) \delta_h)\right)^2$$

$$R_0^2 \Lambda d_v^2 (d_h + \gamma_h + \delta_h) = \beta_v \beta_h \phi d_h$$

Two cases are discussed : First if $R_0 > 1$,

then $A_2 < 0$ with $A_0 > 0$ then $(\lambda_h)^* = \dfrac{-A_1 + \left(\sqrt{A_1^2 - 4 A_0 A_2}\right)}{2 A_0} > 0$ and one endemic equilibrium
point. If, for $R_0 < 1$, $A_2 > 0$,
in this case if $A_1 > 0$ then no endemic equilibrium point which is the condition for
elimination of disease. However,
if $R_0 < 1$ and $A_1 < 0$ then with the further condition $\sqrt{A_1^2 - 4 A_0 A_2} > 0$,
there are two endemic equilibrium point and
the model goes to the backward bifurcation. The two endemic equilibrium

$$\text{points are : } (\lambda_h)^* = \frac{-A_1 + \left(\sqrt{A_1^2 - 4\,A_0\,A_2}\right)}{2\,A_0},\ (\lambda_h)^* = \frac{-A_1 - \left(\sqrt{A_1^2 - 4\,A_0\,A_2}\right)}{2\,A_0}$$

$\delta_h > \frac{d_h\left(q\beta_v + \beta_v\,d_h + \gamma_h\,d_v\,2\right)}{(d_h + q)\,d_v}$ **is the threshold condition for backward bifurcation ,**

the corresponding endemic equilibrium point interms of infected people at home country.

$$y^* = \left(q\,\Lambda\,(\lambda_h)^* + \Lambda\,d_h\,(\lambda_h)^*\right) \Big/ \left(q\,d_h^2 + d_h^3 + q\,d_h\,\gamma_h + d_h^2\,\gamma_h + q\,d_h\,\delta_h + d_h^2\,\delta_h + q\,d_h\,(\lambda_h)^* + d_h^2\,(\lambda_h)^* + d_h\,\gamma_h\,(\lambda_h)^* + q\,\delta_h\,(\lambda_h)^* + d_h\,\delta_h\,(\lambda_h)^*\right)$$

Case - II Complete protection of transmission in abroad k = 0

$B_0\,((\lambda_h)^*)^3 + B_1\,((\lambda_h)^*)^2 + B_2\,(\lambda_h)^* = 0$ **, where** a_0 **reduced to** B_0**,** a_1 **reduced to** B_1 **and** a_2 **to** B_2

In this case the disease free equilibrium point is :

Here $(\lambda_h)^* = 0$ **gives the disease free equilibrium point :**

$E_1 = (x^*, y^*, z^*, X^*, Y^*, Z^*, l^*, m^*) =$

$\left(\frac{\Lambda\,(\eta + d_h)}{d_h\left(2\,\eta + d_h\right)}, 0, 0, \frac{\eta\,\Lambda}{2\,\eta\,d_h + d_h^2}, 0, 0, \phi / d_v, 0\right)$**. The corresponding epidemic index can be obtained using next generation matrix method.**

$$F_1 = \begin{pmatrix} 0 & \beta_h & 0 \\ \frac{\phi\,d_h\,(2\,\eta+d_h)\,\beta_v}{\Lambda\,(\eta+d_h)\,d_v} & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix},\ V_{in1} = \begin{pmatrix} \frac{\theta+d_h+\gamma_h+\delta_h}{-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2} & 0 & \frac{\theta}{-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2} \\ 0 & \frac{1}{d_v} & 0 \\ \frac{\theta}{-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2} & 0 & \frac{\theta+d_h+\gamma_h+\delta_h}{-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2} \end{pmatrix}$$

$$F_1.V_{in1} = \begin{pmatrix} 0 & \frac{\beta_h}{d_v} & 0 \\ \frac{\phi\,d_h\,(2\,\eta+d_h)\,\beta_v\,(\theta+d_h+\gamma_h+\delta_h)}{\Lambda\,(\eta+d_h)\,d_v\left(-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2\right)} & 0 & \frac{\theta\,\phi\,d_h\,(2\,\eta+d_h)\,\beta_v}{\Lambda\,(\eta+d_h)\,d_v\left(-\theta^2+(\theta+d_h+\gamma_h+\delta_h)^2\right)} \\ 0 & 0 & 0 \end{pmatrix}$$

$R_1 =$

$$\sqrt{\left(\left(\beta_h\ \beta_v\,\phi\,d_h\left(2\,\eta + d_h\right)\ (\theta + d_h + \gamma_h + \delta_h)\ \right) \Big/ \left(\Lambda\ (\eta + d_h)\ d_v\ (d_h + \gamma_h + \delta_h)\ \left(2\,\theta + d_h + \gamma_h + \delta_h\right)\right)\right)}$$

The epidemic index $R_1 = \sqrt{R_0\left(1 + \frac{\eta\ (d_h + \gamma_h + \delta_h) - \theta\,d_h}{(\eta + d_h)\ \left(2\,\theta + d_h + \gamma_h + \delta_h\right)}\right)}$

Local stability analysis of the disease free equilibrium point E_{01}

$$J_1 = \begin{pmatrix} -\eta - d_h & 0 & q & \eta & 0 & 0 & 0 & -\beta_h \\ 0 & -\theta - d_h - \gamma_h - \delta_h & 0 & 0 & \theta & 0 & 0 & \beta_h \\ 0 & \gamma_h & -q - \eta - d_h & 0 & 0 & \eta & 0 & 0 \\ \eta & 0 & 0 & -\eta - d_h & 0 & q & 0 & 0 \\ 0 & \theta & 0 & 0 & -\theta - d_h - \gamma_h - \delta_h & 0 & 0 & 0 \\ 0 & 0 & \eta & 0 & \gamma_h & -q - \eta - d_h & 0 & 0 \\ 0 & -\frac{\phi\,d_h\,(2\,\eta+d_h)\,\beta_v}{\Lambda\,(\eta+d_h)\,d_v} & 0 & 0 & 0 & 0 & -d_v & 0 \\ 0 & \frac{\phi\,d_h\,(2\,\eta+d_h)\,\beta_v}{\Lambda\,(\eta+d_h)\,d_v} & 0 & 0 & 0 & 0 & 0 & -d_v \end{pmatrix}$$

Let

$$\begin{pmatrix} -\eta - d_h - \lambda & 0 & q & \eta & 0 & 0 & 0 \\ 0 & -\theta - d_h - \gamma_h - \delta_h - \lambda & 0 & 0 & \theta & 0 & 0 \\ 0 & \gamma_h & -q - \eta - d_h - \lambda & 0 & 0 & \eta & 0 \\ \eta & 0 & 0 & -\eta - d_h - \lambda & 0 & q & 0 \\ 0 & \theta & 0 & 0 & -\theta - d_h - \gamma_h - \delta_h - \lambda & 0 & 0 \\ 0 & 0 & \eta & 0 & \gamma_h & -q - \eta - d_h - \lambda & 0 \\ 0 & -\frac{\phi\, d_h\, (2\,\eta + d_h)\, \beta_v}{\Lambda\, (\eta + d_h)\, d_v} & 0 & 0 & 0 & 0 & -d_v - \\ 0 & \frac{\phi\, d_h\, (2\,\eta + d_h)\, \beta_v}{\Lambda\, (\eta + d_h)\, d_v} & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

Let a be eigenvalues of the jacobian then the charactristic polynomial

$$\frac{1}{\Lambda\, (\eta + d_h)\, d_v}\, (\lambda + d_h)\, (q + \lambda + d_h)\, (2\,\eta + \lambda + d_h)\, (q + 2\,\eta + \lambda + d_h)\, (\lambda + d_v)$$
$$\Big(2\,\eta\,\theta\,\lambda^2\,\Lambda\,d_v + \eta\,\lambda^3\,\Lambda\,d_v + 2\,\eta\,\theta\,\lambda\,\Lambda\,d_h\,d_v + 2\,\eta\,\lambda^2\,\Lambda\,d_h\,d_v + 2\,\theta\,\lambda^2\,\Lambda\,d_h\,d_v + \lambda^3\,\Lambda\,d_h\,d_v +$$
$$\eta\,\lambda\,\Lambda\,d_h^2\,d_v + 2\,\theta\,\lambda\,\Lambda\,d_h^2\,d_v + 2\,\lambda^2\,\Lambda\,d_h^2\,d_v + \lambda\,\Lambda\,d_h^3\,d_v + 2\,\eta\,\theta\,\lambda\,\Lambda\,d_v^2 + \eta\,\lambda^2\,\Lambda\,d_v^2 +$$
$$2\,\eta\,\theta\,\Lambda\,d_h\,d_v^2 + 2\,\eta\,\lambda\,\Lambda\,d_h\,d_v^2 + 2\,\theta\,\lambda\,\Lambda\,d_h\,d_v^2 + \lambda^2\,\Lambda\,d_h\,d_v^2 + \eta\,\Lambda\,d_h^2\,d_v^2 + 2\,\theta\,\Lambda\,d_h^2\,d_v^2 +$$
$$2\,\lambda\,\Lambda\,d_h^2\,d_v^2 + \Lambda\,d_h^3\,d_v^2 - 2\,\eta\,\theta\,\phi\,d_h\,\beta_h\,\beta_v - 2\,\eta\,\lambda\,\phi\,d_h\,\beta_h\,\beta_v - 2\,\eta\,\phi\,d_h^2\,\beta_h\,\beta_v - \theta\,\phi\,d_h^2\,\beta_h\,\beta_v -$$
$$\lambda\,\phi\,d_h^2\,\beta_h\,\beta_v - \phi\,d_h^3\,\beta_h\,\beta_v + 2\,\eta\,\theta\,\lambda\,\Lambda\,d_v\,\gamma_h + 2\,\eta\,\lambda^2\,\Lambda\,d_v\,\gamma_h + 2\,\eta\,\lambda\,\Lambda\,d_h\,d_v\,\gamma_h +$$
$$2\,\theta\,\lambda\,\Lambda\,d_h\,d_v\,\gamma_h + 2\,\lambda^2\,\Lambda\,d_h\,d_v\,\gamma_h + 2\,\lambda\,\Lambda\,d_h^2\,d_v\,\gamma_h + 2\,\eta\,\theta\,\Lambda\,d_v^2\,\gamma_h + 2\,\eta\,\lambda\,\Lambda\,d_v^2\,\gamma_h +$$
$$2\,\eta\,\Lambda\,d_h\,d_v^2\,\gamma_h + 2\,\theta\,\Lambda\,d_h\,d_v^2\,\gamma_h + 2\,\lambda\,\Lambda\,d_h\,d_v^2\,\gamma_h + 2\,\Lambda\,d_h^2\,d_v^2\,\gamma_h - 2\,\eta\,\phi\,d_h\,\beta_h\,\beta_v\,\gamma_h -$$
$$\phi\,d_h^2\,\beta_h\,\beta_v\,\gamma_h + \eta\,\lambda\,\Lambda\,d_v\,\gamma_h^2 + \lambda\,\Lambda\,d_h\,d_v\,\gamma_h^2 + \eta\,\Lambda\,d_v^2\,\gamma_h^2 + \Lambda\,d_h\,d_v^2\,\gamma_h^2 + 2\,\eta\,\theta\,\lambda\,\Lambda\,d_v\,\delta_h +$$
$$2\,\eta\,\lambda^2\,\Lambda\,d_v\,\delta_h + 2\,\eta\,\lambda\,\Lambda\,d_h\,d_v\,\delta_h + 2\,\theta\,\lambda\,\Lambda\,d_h\,d_v\,\delta_h + 2\,\lambda^2\,\Lambda\,d_h\,d_v\,\delta_h + 2\,\lambda\,\Lambda\,d_h^2\,d_v\,\delta_h +$$
$$2\,\eta\,\theta\,\Lambda\,d_v^2\,\delta_h + 2\,\eta\,\lambda\,\Lambda\,d_v^2\,\delta_h + 2\,\eta\,\Lambda\,d_h\,d_v^2\,\delta_h + 2\,\theta\,\Lambda\,d_h\,d_v^2\,\delta_h + 2\,\lambda\,\Lambda\,d_h\,d_v^2\,\delta_h +$$
$$2\,\Lambda\,d_h^2\,d_v^2\,\delta_h - 2\,\eta\,\phi\,d_h\,\beta_h\,\beta_v\,\delta_h - \phi\,d_h^2\,\beta_h\,\beta_v\,\delta_h + 2\,\eta\,\lambda\,\Lambda\,d_v\,\gamma_h\,\delta_h + 2\,\lambda\,\Lambda\,d_h\,d_v\,\gamma_h\,\delta_h +$$
$$2\,\eta\,\Lambda\,d_v^2\,\gamma_h\,\delta_h + 2\,\Lambda\,d_h\,d_v^2\,\gamma_h\,\delta_h + \eta\,\lambda\,\Lambda\,d_v\,\delta_h^2 + \lambda\,\Lambda\,d_h\,d_v\,\delta_h^2 + \eta\,\Lambda\,d_v^2\,\delta_h^2 + \Lambda\,d_h\,d_v^2\,\delta_h^2\Big)$$

There are $-d_h$, d_v, $-(q + d_h)$, $-(2\,\eta + d_h)$, $-(q + 2\,\eta + d_h)$ negative eigenvalues and next is fourth degree polynomial : Taking a = λ

$$\lambda^3 + h_1\,\lambda^2 + h_2\,\lambda + h_3 = 0$$

$$h_1 = 2\,d_h + d_v + 2\,(\theta + \gamma_h + \delta_h)$$

$$h_2 = \frac{d_v\,(d_h + \gamma_h + \delta_h)\,\left(2\,\theta + d_h + \gamma_h + \delta_h\right)}{\theta + d_h + \gamma_h + \delta_h}\,\left(2 - R_1^2\right) + P_1$$

$$h_3 = d_v\,\left(1 - R_1^2\right)\,(d_h + \gamma_h + \delta_h)\,\left(2\,\theta + d_h + \gamma_h + \delta_h\right)$$

$$P_1 = \Big(d_h^3 + 2\,\theta^2\,d_v + 3\,d_h^2\,(\theta + \gamma_h + \delta_h) + d_h\,\left(2\,\theta^2 + 3\,\gamma_h^2 + 6\,\theta\,\delta_h + 3\,\delta_h^2 + 6\,\gamma_h\,(\theta + \delta_h)\right) +$$
$$(\gamma_h + \delta_h)\,\left(2\,\theta^2 + \gamma_h^2 + 3\,\theta\,\delta_h + \delta_h^2 + \gamma_h\,\left(3\,\theta + 2\,\delta_h\right)\right)\Big) \Big/ (\theta + d_h + \gamma_h + \delta_h)$$

$$h_1\,h_2 - h_3 = \left(3 - {R_1}^2\right)\,d_v\,(d_h + \gamma_h + \delta_h)\,\left(2\,\theta + d_h + \gamma_h + \delta_h\right) + 2\,P_1\,\left(2\,\theta + d_h + \gamma_h + \delta_h\right) + P_2 > 0 \text{ if } R_1 < 1$$

$$P_2 = d_v\,\left(\frac{d_v\,(d_h + \gamma_h + \delta_h)\,\left(2\,\theta + d_h + \gamma_h + \delta_h\right)}{\theta + d_h + \gamma_h + \delta_h}\,\left(2 - R_1^2\right) + P_1\right)$$

Thus all eigenvaluess of Jacobian at disease free equilibrium point are with negative real part when R_1<1 and the dfe is locally asymptotically stable for R_1<1 and unstable otherwise. The reduced quadratic equation

$$B_0\ ((\lambda_h)^*)^2 + B_1\ ((\lambda_h)^*) + B_2 = 0$$

$$\begin{aligned}
B_0 &= \Lambda\,(\eta + d_h)^2\, d_v \left(d_h^3 + (q+\eta)\,\gamma_h^2 + q\,(q+2\,\eta)\,(\theta+\delta_h) + \right.\\
&\quad d_h^2\,(2\,q + 2\,\eta + \theta + 2\,\gamma_h + \delta_h) + \gamma_h\,((q+2\,\eta)\,(q+\theta) + (q+\eta)\,\delta_h) +\\
&\quad \left. d_h\,(q^2 + 2\,q\,\eta + 2\,q\,\theta + 2\,\eta\,\theta + \gamma_h^2 + 2\,(q+\eta)\,\delta_h + \gamma_h\,(3\,q + 3\,\eta + \theta + \delta_h))\right)\\
&\quad ((q+d_h)\,(q + 2\,\eta + d_h)\,\beta_v\,(\theta + d_h + \gamma_h + \delta_h) + d_v \left(d_h^3 + (q+\eta)\,\gamma_h^2 + q\,(q+2\,\eta)\,(\theta+\delta_h) + \right.\\
&\quad\quad d_h^2\,(2\,q + 2\,\eta + \theta + 2\,\gamma_h + \delta_h) + \gamma_h\,((q+2\,\eta)\,(q+\theta) + (q+\eta)\,\delta_h) +\\
&\quad\quad \left. d_h\,(q^2 + 2\,q\,\eta + 2\,q\,\theta + 2\,\eta\,\theta + \gamma_h^2 + 2\,(q+\eta)\,\delta_h + \gamma_h\,(3\,q + 3\,\eta + \theta + \delta_h))\right))\\
&\quad (q+d_h)^2\,(\eta + d_h)\,(q + 2\,\eta + d_h)^2\,(d_h + \gamma_h + \delta_h)\,(2\,\theta + d_h + \gamma_h + \delta_h)\,\left(d_h^3\,(\Lambda\,d_v^2 - \phi\,\beta_h\,\beta_v) + \right.\\
&\quad \eta\,\Lambda\,d_v^2\,(\gamma_h + \delta_h)\,(2\,\theta + \gamma_h + \delta_h) + d_h^2\,(-\phi\,\beta_h\,\beta_v\,(2\,\eta + \theta + \gamma_h + \delta_h) + \Lambda\,d_v^2\,(\eta + 2\,\theta + 2\,\gamma_h + 2\,\delta_h)) +\\
&\quad \left. d_h\,(-2\,\eta\,\phi\,\beta_h\,\beta_v\,(\theta + \gamma_h + \delta_h) + \Lambda\,d_v^2\,(2\,\eta\,\theta + \gamma_h^2 + 2\,(\eta+\theta)\,\delta_h + \delta_h^2 + 2\,\gamma_h\,(\eta + \theta + \delta_h)))\right)\\
B_1 &= (q+d_h)^2\,(\eta + d_h)\,(q + 2\,\eta + d_h)^2\,(d_h + \gamma_h + \delta_h)\,(2\,\theta + d_h + \gamma_h + \delta_h)\,\left(d_h^3\,(\Lambda\,d_v^2 - \phi\,\beta_h\,\beta_v) + \right.\\
&\quad \eta\,\Lambda\,d_v^2\,(\gamma_h + \delta_h)\,(2\,\theta + \gamma_h + \delta_h) + d_h^2\,(-\phi\,\beta_h\,\beta_v\,(2\,\eta + \theta + \gamma_h + \delta_h) + \Lambda\,d_v^2\,(\eta + 2\,\theta + 2\,\gamma_h + 2\,\delta_h)) +\\
&\quad \left. d_h\,(-2\,\eta\,\phi\,\beta_h\,\beta_v\,(\theta + \gamma_h + \delta_h) + \Lambda\,d_v^2\,(2\,\eta\,\theta + \gamma_h^2 + 2\,(\eta+\theta)\,\delta_h + \delta_h^2 + 2\,\gamma_h\,(\eta + \theta + \delta_h)))\right)\\
B_2 &= \Lambda\ d_v^2\,(q+d_h)^2\,(\eta + d_h)^2\,(q + 2\,\eta + d_h)^2\,(d_h + \gamma_h + \delta_h)^2\,(2\,\theta + d_h + \gamma_h + \delta_h)^2\,(1 - R_1^2)
\end{aligned}$$

Here also similar result regarding one endemic equilibrium point, two endemic equilibrium point and no endemic equilibrium point i.e elmination of the disease .

Case - III $\theta = 0$; Border screening and Isolation of infected migrants in the border. In this case only the home country is at disease free equilibrium point but migrants are infected in abroad. In this case the reduced equation is

$C_0\ ((\lambda_h)^*)^3 + C_1\ ((\lambda_h)^*)^2 + C_2\ (\lambda_h)^* = 0$, **where** a_0 **reduced** C_0, a_1 **reduced to** C_1 **and** a_2 **to** C_2

$E_1 = (x^*, y^*, z^*, X^*, Y^*, Z^*, l^*, m^*) = \left(\frac{P}{K_1}, 0, \frac{Q_3}{K_1}, \frac{S_1}{K_1}, \frac{T_1}{K_1}, \frac{U_1}{K_1}, \phi / d_v, 0\right)$. The corresponding epidemic index can be obtained using next generation matrix method.

$$F = \begin{pmatrix} 0 & \frac{P\beta_h}{P+Q_3} & 0 \\ \frac{K_1 \phi \beta_v}{(P+Q_3) d_v} & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$

$$V_{inv2} = \begin{pmatrix} \frac{1}{d_h+\gamma_h+\delta_h} & 0 & 0 \\ 0 & \frac{d_h+\gamma_h+\delta_h}{d_h d_v+d_v \gamma_h+d_v \delta_h} & 0 \\ 0 & 0 & \frac{1}{d_h+\gamma_h+\delta_h} \end{pmatrix}$$

$$\begin{pmatrix} 0 & \frac{P\beta_h}{P+Q_3} & 0 \\ \frac{K_1 \phi \beta_v}{(P+Q_3) d_v} & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix} \cdot \begin{pmatrix} \frac{1}{d_h+\gamma_h+\delta_h} & 0 & 0 \\ 0 & \frac{d_h+\gamma_h+\delta_h}{d_h d_v+d_v \gamma_h+d_v \delta_h} & 0 \\ 0 & 0 & \frac{1}{d_h+\gamma_h+\delta_h} \end{pmatrix}$$. Then the largest eigen value of this matrix is

$$R_2 = \sqrt{\frac{\phi\beta_h \beta_v P K_1}{(d_h + \gamma_h + \delta_h)(P + Q_3)^2 d_v^2}}$$

$$R_2 = \sqrt{\Big(\big(\phi\beta_h \beta_v \Lambda \big(d_h^4 + q\eta\,(k + q + 2\eta)\,\gamma_h + q\,(k+\eta)\,(q + 2\eta)\,\delta_h + d_h^3\,(k + 2q + 3\eta + \gamma_h + \delta_h) + d_h\,(q\,(k+\eta)\,(q+2\eta) + (q\,(k+q) + 2\,(k+2q)\,\eta + 2\eta^2)\,\gamma_h + (q^2 + 4q\eta + 2\eta^2 + 2k\,(q+\eta))\,\delta_h) + d_h^2\,(q^2 + 4q\eta + 2\eta^2 + 2k\,(q+\eta) + (k + 2q + 3\eta)\,(\gamma_h + \delta_h))\big)\big(d_h^5 + kq\eta\,(q+2\eta)\,\delta_h + d_h^4\,(k + 2q + 4\eta + \gamma_h + \delta_h) + d_h^2\,(kq^2 + 2q\,(2k+q)\,\eta + 2\,(k+2q)\,\eta^2 + (q\,(k+q) + 3\,(k+2q)\,\eta + 4\eta^2)\,\gamma_h + (2kq + q^2 + 3k\eta + 6q\eta + 4\eta^2)\,\delta_h) + d_h\,(kq\eta\,(q+2\eta) + 2\eta\,(q\,(k+q) + (k+2q)\,\eta)\,\gamma_h + (kq^2 + 2q\,(2k+q)\,\eta + 2\,(k+2q)\,\eta^2)\,\delta_h) + d_h^3\,(2kq + q^2 + 3k\eta + 6q\eta + 4\eta^2 + (k + 2q + 4\eta)\,(\gamma_h + \delta_h)))\big)\Big/\Big((d_h + \gamma_h + \delta_h)\,\big(\Lambda\,(d_h^4 + q\eta\,(k + q + 2\eta)\,\gamma_h + q\,(k+\eta)\,(q+2\eta)\,\delta_h + d_h^3\,(k + 2q + 3\eta + \gamma_h + \delta_h) + d_h\,(q\,(k+\eta)\,(q+2\eta) + (q\,(k+q) + 2\,(k+2q)\,\eta + 2\eta^2)\,\gamma_h + (q^2 + 4q\eta + 2\eta^2 + 2k\,(q+\eta))\,\delta_h) + d_h^2\,(q^2 + 4q\eta + 2\eta^2 + 2k\,(q+\eta) + (k + 2q + 3\eta)\,(\gamma_h + \delta_h))) + (k\eta^2 \Lambda \gamma_h)^2 d_v^2\big)\Big)}$$

Now the local stability of disease free equilibrium point E_{02}

The jacobian of the system at the disease free equilibrium point is

$$J_2 = \begin{pmatrix} -q-\eta-d_h & 0 & q & 0 & -\frac{P\,\beta_h}{P+Q_3} & \eta & 0 & 0 \\ 0 & -d_h-\gamma_h-\delta_h & 0 & 0 & \frac{P\,\beta_h}{P+Q_3} & 0 & 0 & 0 \\ 0 & \gamma_h & -q-\eta-d_h & 0 & 0 & 0 & 0 & \eta \\ 0 & -\frac{K_1\,\phi\,\beta_v}{(P+Q_3)\,d_v} & 0 & -d_v & 0 & 0 & 0 & 0 \\ 0 & \frac{K_1\,\phi\,\beta_v}{(P+Q_3)\,d_v} & 0 & 0 & -d_v & 0 & 0 & 0 \\ \eta & 0 & 0 & 0 & 0 & -k-\eta-d_h & 0 & q \\ 0 & 0 & 0 & 0 & 0 & k & -d_h-\gamma_h-\delta_h & 0 \\ 0 & 0 & \eta & 0 & 0 & 0 & \gamma_h & -q-\eta-d_h \end{pmatrix}$$

Let the eigenvalues of the jacobian λ,

$$\begin{pmatrix} -q-\eta-d_h-\lambda & 0 & q & 0 & -\frac{P\,\beta_h}{P+Q_3} & \eta & 0 \\ 0 & -d_h-\gamma_h-\delta_h-\lambda & 0 & 0 & \frac{P\,\beta_h}{P+Q_3} & 0 & 0 \\ 0 & \gamma_h & -q-\eta-d_h-\lambda & 0 & 0 & 0 & 0 \\ 0 & -\frac{K_1\,\phi\,\beta_v}{(P+Q_3)\,d_v} & 0 & -d_v-\lambda & 0 & 0 & 0 \\ 0 & \frac{K_1\,\phi\,\beta_v}{(P+Q_3)\,d_v} & 0 & 0 & -d_v-\lambda & 0 & 0 \\ \eta & 0 & 0 & 0 & 0 & -k-\eta-d_h-\lambda & 0 \\ 0 & 0 & 0 & 0 & 0 & k & -d_h-\gamma_h-\delta_h- \\ 0 & 0 & \eta & 0 & 0 & 0 & \gamma_h \end{pmatrix}$$

The characteristic polynomial is of degree which split in to three parts:

P (λ) = (d_v + λ) Q (λ) R (λ) . Q (λ) is the quadratic polynomial which split in to two roots :

$$\lambda = \frac{1}{2}\left(-d_h - d_v - \gamma_h - \delta_h - \sqrt{\left((d_h + d_v + \gamma_h + \delta_h)^2 - 4\, d_v \left(1 - R_c^2\right)(d_h + \gamma_h + \delta_h)\right)}\right),$$

$$\lambda = \frac{1}{2}\left(-d_h - d_v - \gamma_h - \delta_h + \sqrt{\left((d_h + d_v + \gamma_h + \delta_h)^2 - 4\, d_v \left(1 - R_c^2\right)(d_h + \gamma_h + \delta_h)\right)}\right)$$

$$R(\lambda) = \lambda^5 + p_1 \lambda^4 + p_1 \lambda^3 + p_1 \lambda^2 + p_1 \lambda + p_1$$

$$p_1 = k + 3q + 4\eta + 5 d_h + \gamma_h + \delta_h$$

$$p_2 = 3kq + 3q^2 + 3k\eta + 9q\eta + 4\eta^2 + 4k d_h + 12 q d_h + 16\eta d_h + 10 d_h^2 + k\gamma_h + 3q\gamma_h + 4\eta\gamma_h + 4 d_h \gamma_h + k\delta_h + 3q\delta_h + 4\eta\delta_h + 4 d_h \delta_h$$

$$p_3 = 3kq^2 + q^3 + 6kq\eta + 6q^2\eta + 2k\eta^2 + 6q\eta^2 + 9kq d_h + 9q^2 d_h + 9k\eta d_h + 27 q\eta d_h + 12\eta^2 d_h + 6k d_h^2 + 18 q d_h^2 + 24\eta d_h^2 + 10 d_h^3 + 2kq\gamma_h + 3q^2\gamma_h + 3k\eta\gamma_h + 9q\eta\gamma_h + 4\eta^2\gamma_h + 3k d_h\gamma_h + 9q d_h\gamma_h + 12\eta d_h\gamma_h + 6 d_h^2\gamma_h + 3kq\delta_h + 3q^2\delta_h + 3k\eta\delta_h + 9q\eta\delta_h + 4\eta^2\delta_h + 3k d_h\delta_h + 9q d_h\delta_h + 12\eta d_h\delta_h + 6 d_h^2\delta_h$$

$$p_4 = kq^3 + 3kq^2\eta + q^3\eta + 2kq\eta^2 + 2q^2\eta^2 + 6kq^2 d_h + 2q^3 d_h + 12kq\eta d_h + 12q^2\eta d_h + 4k\eta^2 d_h + 12 q\eta^2 d_h + 9kq d_h^2 + 9q^2 d_h^2 + 9k\eta d_h^2 + 27 q\eta d_h^2 + 12\eta^2 d_h^2 + 4k d_h^3 + 12 q d_h^3 + 16\eta d_h^3 + 5 d_h^4 + kq^2\gamma_h + q^3\gamma_h + 4kq\eta\gamma_h + 6q^2\eta\gamma_h + 2k\eta^2\gamma_h + 6q\eta^2\gamma_h + 4kq d_h\gamma_h + 6q^2 d_h\gamma_h + 6k\eta d_h\gamma_h + 18 q\eta d_h\gamma_h + 8\eta^2 d_h\gamma_h + 3k d_h^2\gamma_h + 9q d_h^2\gamma_h + 12\eta d_h^2\gamma_h + 4 d_h^3\gamma_h + 3kq^2\delta_h + q^3\delta_h + 6kq\eta\delta_h + 6q^2\eta\delta_h + 2k\eta^2\delta_h + 6q\eta^2\delta_h + 6kq d_h\delta_h + 6q^2 d_h\delta_h + 6k\eta d_h\delta_h + 18 q\eta d_h\delta_h + 8\eta^2 d_h\delta_h + 3k d_h^2\delta_h + 9q d_h^2\delta_h + 12\eta d_h^2\delta_h + 4 d_h^3\delta_h$$

$$p_5 = kq^3 d_h + 3kq^2\eta d_h + q^3\eta d_h + 2kq\eta^2 d_h + 2q^2\eta^2 d_h + 3kq^2 d_h^2 + q^3 d_h^2 + 6kq\eta d_h^2 + 6q^2\eta d_h^2 + 2k\eta^2 d_h^2 + 6q\eta^2 d_h^2 + 3kq d_h^3 + 3q^2 d_h^3 + 3k\eta d_h^3 + 9q\eta d_h^3 + 4\eta^2 d_h^3 + k d_h^4 + 3q d_h^4 + 4\eta d_h^4 + d_h^5 + kq^2\eta\gamma_h + q^3\eta\gamma_h + 2q^2\eta^2\gamma_h + kq^2 d_h\gamma_h + q^3 d_h\gamma_h + 4kq\eta d_h\gamma_h + 6q^2\eta d_h\gamma_h + 2k\eta^2 d_h\gamma_h + 6q\eta^2 d_h\gamma_h + 2kq d_h^2\gamma_h + 3q^2 d_h^2\gamma_h + 3k\eta d_h^2\gamma_h + 9q\eta d_h^2\gamma_h + 4\eta^2 d_h^2\gamma_h + k d_h^3\gamma_h + 3q d_h^3\gamma_h + 4\eta d_h^3\gamma_h + d_h^4\gamma_h + kq^3\delta_h + 3kq^2\eta\delta_h + q^3\eta\delta_h + 2kq\eta^2\delta_h + 2q^2\eta^2\delta_h + 3kq^2 d_h\delta_h + q^3 d_h\delta_h + 6kq\eta d_h\delta_h + 6q^2\eta d_h\delta_h + 2k\eta^2 d_h\delta_h + 6q\eta^2 d_h\delta_h + 3kq d_h^2\delta_h + 3q^2 d_h^2\delta_h + 3k\eta d_h^2\delta_h + 9q\eta d_h^2\delta_h + 4\eta^2 d_h^2\delta_h + k d_h^3\delta_h + 3q d_h^3\delta_h + 4\eta d_h^3\delta_h + d_h^4\delta_h$$

Now moving on the Hurwitz criteria to have eigenvalues with negative real parts :

$$p_1 p_2 p_3 - p_3 p_3 - p_1 p_1 p_4 =$$

$$8k^3q^3 + 24k^2q^4 + 24kq^5 + 8q^6 + 24k^3q^2\eta + 120k^2q^3\eta + 168kq^4\eta + 72q^5\eta + 22k^3q\eta^2 + 202k^2q^2\eta^2 + 426kq^3\eta^2 + 246q^4\eta^2 + 6k^3\eta^3 + 134k^2q\eta^3 + 482kq^2\eta^3 + 402q^3\eta^3 + 28k^2\eta^4 + 232kq\eta^4 + 316q^2\eta^4 + 32k\eta^5 + 96q\eta^5 + 33k^3q^2 d_h + 154k^2q^3 d_h + 213kq^4 d_h + 96q^5 d_h + 66k^3q\eta d_h + 561k^2q^2\eta d_h + 1160kq^3\eta d_h + 693q^4\eta d_h + 31k^3\eta^2 d_h + 619k^2q\eta^2 d_h + 2161kq^2\eta^2 d_h + 1845q^3\eta^2 d_h + 206k^2\eta^3 d_h + 1612kq\eta^3 d_h + 2230q^2\eta^3 d_h + 392k\eta^4 d_h + 1176q\eta^4 d_h + 192\eta^5 d_h + 45k^3q d_h^2 + 363k^2q^2 d_h^2 + 738kq^3 d_h^2 + 453q^4 d_h^2 + 45k^3\eta d_h^2 + 861k^2q\eta d_h^2 + 2940kq^2\eta d_h^2 + 2550q^3\eta d_h^2 + 470k^2\eta^2 d_h^2 + 3586kq\eta^2 d_h^2 + 4996q^2\eta^2 d_h^2 + 1328k\eta^3 d_h^2 + 3984q\eta^3 d_h^2 + 1056\eta^4 d_h^2 + 20k^3 d_h^3 + 372k^2q d_h^3 + 1248kq^2 d_h^3 + 1096q^3 d_h^3 + 432k^2\eta d_h^3 + 3240kq\eta d_h^3 + 4536q^2\eta d_h^3 + 1944k\eta^2 d_h^3 + 5832q\eta^2 d_h^3 + 2304\eta^3 d_h^3 + 139k^2 d_h^4 + 1029kq d_h^4 + 1446q^2 d_h^4 + 1307k\eta d_h^4 + 3921q\eta d_h^4 + 2484\eta^2 d_h^4 + 330k d_h^5 +$$

$$990\,q\,d_h^5 + 1320\,\eta\,d_h^5 + 275\,d_h^6 + 8\,k^3\,q^2\,\gamma_h + 40\,k^2\,q^3\,\gamma_h + 56\,k\,q^4\,\gamma_h + 24\,q^5\,\gamma_h + 17\,k^3\,q\,\eta\,\gamma_h +$$
$$139\,k^2\,q^2\,\eta\,\gamma_h + 287\,k\,q^3\,\eta\,\gamma_h + 165\,q^4\,\eta\,\gamma_h + 9\,k^3\,\eta^2\,\gamma_h + 153\,k^2\,q\,\eta^2\,\gamma_h + 523\,k\,q^2\,\eta^2\,\gamma_h +$$
$$435\,q^3\,\eta^2\,\gamma_h + 54\,k^2\,\eta^3\,\gamma_h + 396\,k\,q\,\eta^3\,\gamma_h + 542\,q^2\,\eta^3\,\gamma_h + 104\,k\,\eta^4\,\gamma_h + 312\,q\,\eta^4\,\gamma_h + 64\,\eta^5\,\gamma_h +$$
$$22\,k^3\,q\,d_h\,\gamma_h + 176\,k^2\,q^2\,d_h\,\gamma_h + 361\,k\,q^3\,d_h\,\gamma_h + 213\,q^4\,d_h\,\gamma_h + 24\,k^3\,\eta\,d_h\,\gamma_h + 409\,k^2\,q\,\eta\,d_h\,\gamma_h +$$
$$1379\,k\,q^2\,\eta\,d_h\,\gamma_h + 1168\,q^3\,\eta\,d_h\,\gamma_h + 228\,k^2\,\eta^2\,d_h\,\gamma_h + 1664\,k\,q\,\eta^2\,d_h\,\gamma_h + 2296\,q^2\,\eta^2\,d_h\,\gamma_h +$$
$$632\,k\,\eta^3\,d_h\,\gamma_h + 1896\,q\,\eta^3\,d_h\,\gamma_h + 544\,\eta^4\,d_h\,\gamma_h + 15\,k^3\,d_h^2\,\gamma_h + 257\,k^2\,q\,d_h^2\,\gamma_h + 860\,k\,q^2\,d_h^2\,\gamma_h +$$
$$738\,q^3\,d_h^2\,\gamma_h + 300\,k^2\,\eta\,d_h^2\,\gamma_h + 2176\,k\,q\,\eta\,d_h^2\,\gamma_h + 3018\,q^2\,\eta\,d_h^2\,\gamma_h + 1306\,k\,\eta^2\,d_h^2\,\gamma_h + 3918\,q\,\eta^2\,d_h^2\,\gamma_h +$$
$$1600\,\eta^3\,d_h^2\,\gamma_h + 124\,k^2\,d_h^3\,\gamma_h + 896\,k\,q\,d_h^3\,\gamma_h + 1248\,q^2\,d_h^3\,\gamma_h + 1124\,k\,\eta\,d_h^3\,\gamma_h + 3372\,q\,\eta\,d_h^3\,\gamma_h +$$
$$2160\,\eta^2\,d_h^3\,\gamma_h + 343\,k\,d_h^4\,\gamma_h + 1029\,q\,d_h^4\,\gamma_h + 1372\,\eta\,d_h^4\,\gamma_h + 330\,d_h^5\,\gamma_h + 2\,k^3\,q\,\gamma_h^2 + 18\,k^2\,q^2\,\gamma_h^2 +$$
$$40\,k\,q^3\,\gamma_h^2 + 24\,q^4\,\gamma_h^2 + 3\,k^3\,\eta\,\gamma_h^2 + 44\,k^2\,q\,\eta\,\gamma_h^2 + 151\,k\,q^2\,\eta\,\gamma_h^2 + 130\,q^3\,\eta\,\gamma_h^2 + 26\,k^2\,\eta^2\,\gamma_h^2 +$$
$$182\,k\,q\,\eta^2\,\gamma_h^2 + 256\,q^2\,\eta^2\,\gamma_h^2 + 72\,k\,\eta^3\,\gamma_h^2 + 216\,q\,\eta^3\,\gamma_h^2 + 64\,\eta^4\,\gamma_h^2 + 3\,k^3\,d_h\,\gamma_h^2 + 51\,k^2\,q\,d_h\,\gamma_h^2 +$$
$$176\,k\,q^2\,d_h\,\gamma_h^2 + 154\,q^3\,d_h\,\gamma_h^2 + 63\,k^2\,\eta\,d_h\,\gamma_h^2 + 446\,k\,q\,\eta\,d_h\,\gamma_h^2 + 627\,q^2\,\eta\,d_h\,\gamma_h^2 + 272\,k\,\eta^2\,d_h\,\gamma_h^2 +$$
$$816\,q\,\eta^2\,d_h\,\gamma_h^2 + 336\,\eta^3\,d_h\,\gamma_h^2 + 36\,k^2\,d_h^2\,\gamma_h^2 + 257\,k\,q\,d_h^2\,\gamma_h^2 + 363\,q^2\,d_h^2\,\gamma_h^2 + 327\,k\,\eta\,d_h^2\,\gamma_h^2 +$$
$$981\,q\,\eta\,d_h^2\,\gamma_h^2 + 628\,\eta^2\,d_h^2\,\gamma_h^2 + 124\,k\,d_h^3\,\gamma_h^2 + 372\,q\,d_h^3\,\gamma_h^2 + 496\,\eta\,d_h^3\,\gamma_h^2 + 139\,d_h^4\,\gamma_h^2 + 2\,k^2\,q\,\gamma_h^3 +$$
$$8\,k\,q^2\,\gamma_h^3 + 8\,q^3\,\gamma_h^3 + 3\,k^2\,\eta\,\gamma_h^3 + 22\,k\,q\,\eta\,\gamma_h^3 + 33\,q^2\,\eta\,\gamma_h^3 + 14\,k\,\eta^2\,\gamma_h^3 + 42\,q\,\eta^2\,\gamma_h^3 + 16\,\eta^3\,\gamma_h^3 + 3\,k^2\,d_h\,\gamma_h^3 +$$
$$22\,k\,q\,d_h\,\gamma_h^3 + 33\,q^2\,d_h\,\gamma_h^3 + 30\,k\,\eta\,d_h\,\gamma_h^3 + 90\,q\,\eta\,d_h\,\gamma_h^3 + 56\,\eta^2\,d_h\,\gamma_h^3 + 15\,k\,d_h^2\,\gamma_h^3 + 45\,q\,d_h^2\,\gamma_h^3 +$$
$$60\,\eta\,d_h^2\,\gamma_h^3 + 20\,d_h^3\,\gamma_h^3 + 9\,k^3\,q^2\,\delta_h + 34\,k^2\,q^3\,\delta_h + 45\,k\,q^4\,\delta_h + 24\,q^5\,\delta_h + 18\,k^3\,q\,\eta\,\delta_h + 129\,k^2\,q^2\,\eta\,\delta_h +$$
$$248\,k\,q^3\,\eta\,\delta_h + 165\,q^4\,\eta\,\delta_h + 9\,k^3\,\eta^2\,\delta_h + 149\,k^2\,q\,\eta^2\,\delta_h + 479\,k\,q^2\,\eta^2\,\delta_h + 435\,q^3\,\eta^2\,\delta_h +$$
$$54\,k^2\,\eta^3\,\delta_h + 380\,k\,q\,\eta^3\,\delta_h + 542\,q^2\,\eta^3\,\delta_h + 104\,k\,\eta^4\,\delta_h + 312\,q\,\eta^4\,\delta_h + 64\,\eta^5\,\delta_h + 24\,k^3\,q\,d_h\,\delta_h +$$
$$165\,k^2\,q^2\,d_h\,\delta_h + 316\,k\,q^3\,d_h\,\delta_h + 213\,q^4\,d_h\,\delta_h + 24\,k^3\,\eta\,d_h\,\delta_h + 402\,k^2\,q\,\eta\,d_h\,\delta_h + 1278\,k\,q^2\,\eta\,d_h\,\delta_h +$$
$$1168\,q^3\,\eta\,d_h\,\delta_h + 228\,k^2\,\eta^2\,d_h\,\delta_h + 1612\,k\,q\,\eta^2\,d_h\,\delta_h + 2296\,q^2\,\eta^2\,d_h\,\delta_h + 632\,k\,\eta^3\,d_h\,\delta_h +$$
$$1896\,q\,\eta^3\,d_h\,\delta_h + 544\,\eta^4\,d_h\,\delta_h + 15\,k^3\,d_h^2\,\delta_h + 255\,k^2\,q\,d_h^2\,\delta_h + 804\,k\,q^2\,d_h^2\,\delta_h + 738\,q^3\,d_h^2\,\delta_h +$$
$$300\,k^2\,\eta\,d_h^2\,\delta_h + 2118\,k\,q\,\eta\,d_h^2\,\delta_h + 3018\,q^2\,\eta\,d_h^2\,\delta_h + 1306\,k\,\eta^2\,d_h^2\,\delta_h + 3918\,q\,\eta^2\,d_h^2\,\delta_h + 1600\,\eta^3\,d_h^2\,\delta_h +$$
$$124\,k^2\,d_h^3\,\delta_h + 876\,k\,q\,d_h^3\,\delta_h + 1248\,q^2\,d_h^3\,\delta_h + 1124\,k\,\eta\,d_h^3\,\delta_h + 3372\,q\,\eta\,d_h^3\,\delta_h + 2160\,\eta^2\,d_h^3\,\delta_h +$$
$$343\,k\,d_h^4\,\delta_h + 1029\,q\,d_h^4\,\delta_h + 1372\,\eta\,d_h^4\,\delta_h + 330\,d_h^5\,\delta_h + 5\,k^3\,q\,\gamma_h\,\delta_h + 37\,k^2\,q^2\,\gamma_h\,\delta_h + 74\,k\,q^3\,\gamma_h\,\delta_h +$$
$$48\,q^4\,\gamma_h\,\delta_h + 6\,k^3\,\eta\,\gamma_h\,\delta_h + 89\,k^2\,q\,\eta\,\gamma_h\,\delta_h + 289\,k\,q^2\,\eta\,\gamma_h\,\delta_h + 260\,q^3\,\eta\,\gamma_h\,\delta_h + 52\,k^2\,\eta^2\,\gamma_h\,\delta_h +$$
$$360\,k\,q\,\eta^2\,\gamma_h\,\delta_h + 512\,q^2\,\eta^2\,\gamma_h\,\delta_h + 144\,k\,\eta^3\,\gamma_h\,\delta_h + 432\,q\,\eta^3\,\gamma_h\,\delta_h + 128\,\eta^4\,\gamma_h\,\delta_h + 6\,k^3\,d_h\,\gamma_h\,\delta_h +$$
$$105\,k^2\,q\,d_h\,\gamma_h\,\delta_h + 341\,k\,q^2\,d_h\,\gamma_h\,\delta_h + 308\,q^3\,d_h\,\gamma_h\,\delta_h + 126\,k^2\,\eta\,d_h\,\gamma_h\,\delta_h + 884\,k\,q\,\eta\,d_h\,\gamma_h\,\delta_h +$$
$$1254\,q^2\,\eta\,d_h\,\gamma_h\,\delta_h + 544\,k\,\eta^2\,d_h\,\gamma_h\,\delta_h + 1632\,q\,\eta^2\,d_h\,\gamma_h\,\delta_h + 672\,\eta^3\,d_h\,\gamma_h\,\delta_h + 72\,k^2\,d_h^2\,\gamma_h\,\delta_h +$$
$$512\,k\,q\,d_h^2\,\gamma_h\,\delta_h + 726\,q^2\,d_h^2\,\gamma_h\,\delta_h + 654\,k\,\eta\,d_h^2\,\gamma_h\,\delta_h + 1962\,q\,\eta\,d_h^2\,\gamma_h\,\delta_h + 1256\,\eta^2\,d_h^2\,\gamma_h\,\delta_h +$$
$$248\,k\,d_h^3\,\gamma_h\,\delta_h + 744\,q\,d_h^3\,\gamma_h\,\delta_h + 992\,\eta\,d_h^3\,\gamma_h\,\delta_h + 278\,d_h^4\,\gamma_h\,\delta_h + 7\,k^2\,q\,\gamma_h^2\,\delta_h + 25\,k\,q^2\,\gamma_h^2\,\delta_h +$$
$$24\,q^3\,\gamma_h^2\,\delta_h + 9\,k^2\,\eta\,\gamma_h^2\,\delta_h + 68\,k\,q\,\eta\,\gamma_h^2\,\delta_h + 99\,q^2\,\eta\,\gamma_h^2\,\delta_h + 42\,k\,\eta^2\,\gamma_h^2\,\delta_h + 126\,q\,\eta^2\,\gamma_h^2\,\delta_h + 48\,\eta^3\,\gamma_h^2\,\delta_h +$$
$$9\,k^2\,d_h\,\gamma_h^2\,\delta_h + 68\,k\,q\,d_h\,\gamma_h^2\,\delta_h + 99\,q^2\,d_h\,\gamma_h^2\,\delta_h + 90\,k\,\eta\,d_h\,\gamma_h^2\,\delta_h + 270\,q\,\eta\,d_h\,\gamma_h^2\,\delta_h + 168\,\eta^2\,d_h\,\gamma_h^2\,\delta_h +$$
$$45\,k\,d_h^2\,\gamma_h^2\,\delta_h + 135\,q\,d_h^2\,\gamma_h^2\,\delta_h + 180\,\eta\,d_h^2\,\gamma_h^2\,\delta_h + 60\,d_h^3\,\gamma_h^2\,\delta_h + 3\,k^3\,q\,\delta_h^2 + 18\,k^2\,q^2\,\delta_h^2 + 34\,k\,q^3\,\delta_h^2 +$$
$$24\,q^4\,\delta_h^2 + 3\,k^3\,\eta\,\delta_h^2 + 45\,k^2\,q\,\eta\,\delta_h^2 + 138\,k\,q^2\,\eta\,\delta_h^2 + 130\,q^3\,\eta\,\delta_h^2 + 26\,k^2\,\eta^2\,\delta_h^2 + 178\,k\,q\,\eta^2\,\delta_h^2 +$$
$$256\,q^2\,\eta^2\,\delta_h^2 + 72\,k\,\eta^3\,\delta_h^2 + 216\,q\,\eta^3\,\delta_h^2 + 64\,\eta^4\,\delta_h^2 + 3\,k^3\,d_h\,\delta_h^2 + 54\,k^2\,q\,d_h\,\delta_h^2 + 165\,k\,q^2\,d_h\,\delta_h^2 +$$
$$154\,q^3\,d_h\,\delta_h^2 + 63\,k^2\,\eta\,d_h\,\delta_h^2 + 438\,k\,q\,\eta\,d_h\,\delta_h^2 + 627\,q^2\,\eta\,d_h\,\delta_h^2 + 272\,k\,\eta^2\,d_h\,\delta_h^2 + 816\,q\,\eta^2\,d_h\,\delta_h^2 +$$
$$336\,\eta^3\,d_h\,\delta_h^2 + 36\,k^2\,d_h^2\,\delta_h^2 + 255\,k\,q\,d_h^2\,\delta_h^2 + 363\,q^2\,d_h^2\,\delta_h^2 + 327\,k\,\eta\,d_h^2\,\delta_h^2 + 981\,q\,\eta\,d_h^2\,\delta_h^2 + 628\,\eta^2\,d_h^2\,\delta_h^2 +$$
$$124\,k\,d_h^3\,\delta_h^2 + 372\,q\,d_h^3\,\delta_h^2 + 496\,\eta\,d_h^3\,\delta_h^2 + 139\,d_h^4\,\delta_h^2 + 8\,k^2\,q\,\gamma_h\,\delta_h^2 + 26\,k\,q^2\,\gamma_h\,\delta_h^2 + 24\,q^3\,\gamma_h\,\delta_h^2 +$$
$$9\,k^2\,\eta\,\gamma_h\,\delta_h^2 + 70\,k\,q\,\eta\,\gamma_h\,\delta_h^2 + 99\,q^2\,\eta\,\gamma_h\,\delta_h^2 + 42\,k\,\eta^2\,\gamma_h\,\delta_h^2 + 126\,q\,\eta^2\,\gamma_h\,\delta_h^2 + 48\,\eta^3\,\gamma_h\,\delta_h^2 +$$
$$9\,k^2\,d_h\,\gamma_h\,\delta_h^2 + 70\,k\,q\,d_h\,\gamma_h\,\delta_h^2 + 99\,q^2\,d_h\,\gamma_h\,\delta_h^2 + 90\,k\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 270\,q\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 168\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 +$$
$$45\,k\,d_h^2\,\gamma_h\,\delta_h^2 + 135\,q\,d_h^2\,\gamma_h\,\delta_h^2 + 180\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 + 60\,d_h^3\,\gamma_h\,\delta_h^2 + 3\,k^2\,q\,\delta_h^3 + 9\,k\,q^2\,\delta_h^3 + 8\,q^3\,\delta_h^3 +$$
$$3\,k^2\,\eta\,\delta_h^3 + 24\,k\,q\,\eta\,\delta_h^3 + 33\,q^2\,\eta\,\delta_h^3 + 14\,k\,\eta^2\,\delta_h^3 + 42\,q\,\eta^2\,\delta_h^3 + 16\,\eta^3\,\delta_h^3 + 3\,k^2\,d_h\,\delta_h^3 + 24\,k\,q\,d_h\,\delta_h^3 +$$

$(p_1\, p_2\, p_3 - p_3\, p_3 - p_1\, p_1\, p_4)\, (p_1\, p_4 - p_5) =$

poly2 =

$$8\, k^5\, q^6 + 48\, k^4\, q^7 + 96\, k^3\, q^8 + 80\, k^2\, q^9 + 24\, k\, q^{10} + 48\, k^5\, q^5\, \eta + 376\, k^4\, q^6\, \eta + 960\, k^3\, q^7\, \eta + 1008\, k^2\, q^8\, \eta + 400\, k\, q^9\, \eta + 24\, q^{10}\, \eta + 110\, k^5\, q^4\, \eta^2 + 1172\, k^4\, q^5\, \eta^2 + \texttt{OutputSizeLimit`Skeleton}[2958] + 1104\, k\, \eta^2\, d_h^3\, \delta_h^5 + 3312\, q\, \eta^2\, d_h^3\, \delta_h^5 + 1216\, \eta^3\, d_h^3\, \delta_h^5 + 57\, k^2\, d_h^4\, \delta_h^5 + 486\, k\, q\, d_h^4\, \delta_h^5 + 657\, q^2\, d_h^4\, \delta_h^5 + 600\, k\, \eta\, d_h^4\, \delta_h^5 + 1800\, q\, \eta\, d_h^4\, \delta_h^5 + 1104\, \eta^2\, d_h^4\, \delta_h^5 + 120\, k\, d_h^5\, \delta_h^5 + 360\, q\, d_h^5\, \delta_h^5 + 480\, \eta\, d_h^5\, \delta_h^5 + 80\, d_h^6\, \delta_h^5$$

$p_5\, (p_1\, p_2 - p_3)\, (p_1\, p_2 - p_3) + p_1\, p_5\, p_5$

poly3 =

$$9\, k^5\, q^5\, d_h + 54\, k^4\, q^6\, d_h + 129\, k^3\, q^7\, d_h + 144\, k^2\, q^8\, d_h + 64\, k\, q^9\, d_h + 45\, k^5\, q^4\, \eta\, d_h + 369\, k^4\, q^5\, \eta\, d_h + 1119\, k^3\, q^6\, \eta\, d_h + 1539\, k^2\, q^7\, \eta\, d_h + 864\, k\, q^8\, \eta\, d_h + 64\, q^9\, \eta\, d_h + 81\, k^5\, q^3\, \eta^2\, d_h + \texttt{OutputSizeLimit`Skeleton}[2727] + 624\, q\, \eta^2\, d_h^3\, \delta_h^5 + 192\, \eta^3\, d_h^3\, \delta_h^5 + 9\, k^2\, d_h^4\, \delta_h^5 + 102\, k\, q\, d_h^4\, \delta_h^5 + 129\, q^2\, d_h^4\, \delta_h^5 + 120\, k\, \eta\, d_h^4\, \delta_h^5 + 360\, q\, \eta\, d_h^4\, \delta_h^5 + 208\, \eta^2\, d_h^4\, \delta_h^5 + 24\, k\, d_h^5\, \delta_h^5 + 72\, q\, d_h^5\, \delta_h^5 + 96\, \eta\, d_h^5\, \delta_h^5 + 16\, d_h^6\, \delta_h^5$$

poly2 - poly3

$$8\, k^5\, q^6 + 48\, k^4\, q^7 + 96\, k^3\, q^8 + 80\, k^2\, q^9 + 24\, k\, q^{10} + 48\, k^5\, q^5\, \eta + 376\, k^4\, q^6\, \eta + 960\, k^3\, q^7\, \eta + 1008\, k^2\, q^8\, \eta + 400\, k\, q^9\, \eta + 24\, q^{10}\, \eta + 110\, k^5\, q^4\, \eta^2 + 1172\, k^4\, q^5\, \eta^2 + 3896\, k^3\, q^6\, \eta^2 + 5188\, k^2\, q^7\, \eta^2 + 2650\, k\, q^8\, \eta^2 + 296\, q^9\, \eta^2 + 120\, k^5\, q^3\, \eta^3 + 1850\, k^4\, q^4\, \eta^3 + 8288\, k^3\, q^5\, \eta^3 + 14\,244\, k^2\, q^6\, \eta^3 + 9304\, k\, q^7\, \eta^3 + 1522\, q^8\, \eta^3 + 62\, k^5\, q^2\, \eta^4 + 1550\, k^4\, q^3\, \eta^4 + 9920\, k^3\, q^4\, \eta^4 + 22\,704\, k^2\, q^5\, \eta^4 + 19\,122\, k\, q^6\, \eta^4 + 4242\, q^7\, \eta^4 + 12\, k^5\, q\, \eta^5 + 648\, k^4\, q^2\, \eta^5 + 6616\, k^3\, q^3\, \eta^5 + 21\,280\, k^2\, q^4\, \eta^5 + 23\,644\, k\, q^5\, \eta^5 + 6936\, q^6\, \eta^5 + 104\, k^4\, q\, \eta^6 + 2240\, k^3\, q^2\, \eta^6 + 11\,216\, k^2\, q^3\, \eta^6 + 17\,152\, k\, q^4\, \eta^6 + 6664\, q^5\, \eta^6 + 288\, k^3\, q\, \eta^7 + 2912\, k^2\, q^2\, \eta^7 + 6624\, k\, q^3\, \eta^7 + 3488\, q^4\, \eta^7 + 256\, k^2\, q\, \eta^8 + 1024\, k\, q^2\, \eta^8 + 768\, q^3\, \eta^8 + 72\, k^5\, q^5\, d_h + 535\, k^4\, q^6\, d_h + 1314\, k^3\, q^7\, d_h + 1359\, k^2\, q^8\, d_h + 560\, k\, q^9\, d_h + 48\, q^{10}\, d_h + 360\, k^5\, q^4\, \eta\, d_h + 3570\, k^4\, q^5\, \eta\, d_h + 11\,338\, k^3\, q^6\, \eta\, d_h + 14\,814\, k^2\, q^7\, \eta\, d_h + 7758\, k\, q^8\, \eta\, d_h + 1040\, q^9\, \eta\, d_h + 666\, k^5\, q^3\, \eta^2\, d_h + 9253\, k^4\, q^4\, \eta^2\, d_h + 39\,046\, k^3\, q^5\, \eta^2\, d_h + 65\,408\, k^2\, q^6\, \eta^2\, d_h + 43\,448\, k\, q^7\, \eta^2\, d_h + 8051\, q^8\, \eta^2\, d_h + 558\, k^5\, q^2\, \eta^3\, d_h + 11\,742\, k^4\, q^3\, \eta^3\, d_h + 68\,862\, k^3\, q^4\, \eta^3\, d_h + 151\,854\, k^2\, q^5\, \eta^3\, d_h + 129\,196\, k\, q^6\, \eta^3\, d_h + 31\,644\, q^7\, \eta^3\, d_h + 204\, k^5\, q\, \eta^4\, d_h + 7510\, k^4\, q^2\, \eta^4\, d_h + 66\,044\, k^3\, q^3\, \eta^4\, d_h + 200\,236\, k^2\, q^4\, \eta^4\, d_h + 223\,104\, k\, q^5\, \eta^4\, d_h + 71\,414\, q^6\, \eta^4\, d_h + 24\, k^5\, \eta^5\, d_h + 2196\, k^4\, q\, \eta^5\, d_h + 33\,452\, k^3\, q^2\, \eta^5\, d_h + 150\,116\, k^2\, q^3\, \eta^5\, d_h + 227\,788\, k\, q^4\, \eta^5\, d_h + 96\,248\, q^5\, \eta^5\, d_h + 208\, k^4\, \eta^6\, d_h + 7832\, k^3\, q\, \eta^6\, d_h + 59\,880\, k^2\, q^2\, \eta^6\, d_h + 132\,392\, k\, q^3\, \eta^6\, d_h + 76\,168\, q^4\, \eta^6\, d_h + 576\, k^3\, \eta^7\, d_h +$$

$$10\,624\,k^2\,q\,\eta^7\,d_h + 38\,848\,k\,q^2\,\eta^7\,d_h + 32\,384\,q^3\,\eta^7\,d_h + 512\,k^2\,\eta^8\,d_h + 4096\,k\,q\,\eta^8\,d_h +$$
$$5632\,q^2\,\eta^8\,d_h + 264\,k^5\,q^4\,d_h^2 + 2511\,k^4\,q^5\,d_h^2 + 7717\,k^3\,q^6\,d_h^2 + 9927\,k^2\,q^7\,d_h^2 + 5301\,k\,q^8\,d_h^2 +$$
$$800\,q^9\,d_h^2 + 1056\,k^5\,q^3\,\eta\,d_h^2 + 13\,875\,k^4\,q^4\,\eta\,d_h^2 + 56\,346\,k^3\,q^5\,\eta\,d_h^2 + 92\,640\,k^2\,q^6\,\eta\,d_h^2 +$$
$$62\,262\,k\,q^7\,\eta\,d_h^2 + 12\,501\,q^8\,\eta\,d_h^2 + 1476\,k^5\,q^2\,\eta^2\,d_h^2 + 28\,700\,k^4\,q^3\,\eta^2\,d_h^2 + 160\,218\,k^3\,q^4\,\eta^2\,d_h^2 +$$
$$344\,898\,k^2\,q^5\,\eta^2\,d_h^2 + 295\,194\,k\,q^6\,\eta^2\,d_h^2 + 76\,842\,q^7\,\eta^2\,d_h^2 + 840\,k^5\,q\,\eta^3\,d_h^2 + 27\,420\,k^4\,q^2\,\eta^3\,d_h^2 +$$
$$224\,992\,k^3\,q^3\,\eta^3\,d_h^2 + 659\,784\,k^2\,q^4\,\eta^3\,d_h^2 + 735\,480\,k\,q^5\,\eta^3\,d_h^2 + 247\,420\,q^6\,\eta^3\,d_h^2 + 160\,k^5\,\eta^4\,d_h^2 +$$
$$11\,864\,k^4\,q\,\eta^4\,d_h^2 + 162\,104\,k^3\,q^2\,\eta^4\,d_h^2 + 692\,008\,k^2\,q^3\,\eta^4\,d_h^2 + 1\,043\,496\,k\,q^4\,\eta^4\,d_h^2 +$$
$$460\,032\,q^5\,\eta^4\,d_h^2 + 1800\,k^4\,\eta^5\,d_h^2 + 55\,392\,k^3\,q\,\eta^5\,d_h^2 + 389\,520\,k^2\,q^2\,\eta^5\,d_h^2 + 847\,264\,k\,q^3\,\eta^5\,d_h^2 +$$
$$505\,704\,q^4\,\eta^5\,d_h^2 + 6704\,k^3\,\eta^6\,d_h^2 + 104\,752\,k^2\,q\,\eta^6\,d_h^2 + 370\,576\,k\,q^2\,\eta^6\,d_h^2 + 318\,224\,q^3\,\eta^6\,d_h^2 +$$
$$9600\,k^2\,\eta^7\,d_h^2 + 73\,728\,k\,q\,\eta^7\,d_h^2 + 102\,528\,q^2\,\eta^7\,d_h^2 + 4096\,k\,\eta^8\,d_h^2 + 12\,288\,q\,\eta^8\,d_h^2 + 504\,k^5\,q^3\,d_h^3 +$$
$$6426\,k^4\,q^4\,d_h^3 + 25\,410\,k^3\,q^5\,d_h^3 + 41\,155\,k^2\,q^6\,d_h^3 + 27\,906\,k\,q^7\,d_h^3 + 5934\,q^8\,d_h^3 + 1512\,k^5\,q^2\,\eta\,d_h^3 +$$
$$28\,224\,k^4\,q^3\,\eta\,d_h^3 + 152\,754\,k^3\,q^4\,\eta\,d_h^3 + 323\,160\,k^2\,q^5\,\eta\,d_h^3 + 277\,652\,k\,q^6\,\eta\,d_h^3 + 75\,378\,q^7\,\eta\,d_h^3 +$$
$$1416\,k^5\,q\,\eta^2\,d_h^3 + 43\,656\,k^4\,q^2\,\eta^2\,d_h^3 + 344\,432\,k^3\,q^3\,\eta^2\,d_h^3 + 988\,403\,k^2\,q^4\,\eta^2\,d_h^3 + 1\,101\,422\,k\,q^5\,\eta^2\,d_h^3 +$$
$$382\,823\,q^6\,\eta^2\,d_h^3 + 408\,k^5\,\eta^3\,d_h^3 + 27\,864\,k^4\,q\,\eta^3\,d_h^3 + 361\,032\,k^3\,q^2\,\eta^3\,d_h^3 + 1\,497\,580\,k^2\,q^3\,\eta^3\,d_h^3 +$$
$$2\,247\,488\,k\,q^4\,\eta^3\,d_h^3 + 1\,017\,020\,q^5\,\eta^3\,d_h^3 + 6088\,k^4\,\eta^4\,d_h^3 + 173\,520\,k^3\,q\,\eta^4\,d_h^3 + 1\,171\,884\,k^2\,q^2\,\eta^4\,d_h^3 +$$
$$2\,522\,696\,k\,q^3\,\eta^4\,d_h^3 + 1\,537\,188\,q^4\,\eta^4\,d_h^3 + 29\,904\,k^3\,\eta^5\,d_h^3 + 440\,048\,k^2\,q\,\eta^5\,d_h^3 + 1\,528\,880\,k\,q^2\,\eta^5\,d_h^3 +$$
$$1\,332\,752\,q^3\,\eta^5\,d_h^3 + 59\,712\,k^2\,\eta^6\,d_h^3 + 446\,976\,k\,q\,\eta^6\,d_h^3 + 626\,112\,q^2\,\eta^6\,d_h^3 + 45\,056\,k\,\eta^7\,d_h^3 +$$
$$135\,168\,q\,\eta^7\,d_h^3 + 8192\,\eta^8\,d_h^3 + 528\,k^5\,q^2\,d_h^4 + 9670\,k^4\,q^3\,d_h^4 + 51\,285\,k^3\,q^4\,d_h^4 + 107\,040\,k^2\,q^5\,d_h^4 +$$
$$92\,204\,k\,q^6\,d_h^4 + 25\,821\,q^7\,d_h^4 + 1056\,k^5\,q\,\eta\,d_h^4 + 31\,650\,k^4\,q^2\,\eta\,d_h^4 + 243\,820\,k^3\,q^3\,\eta\,d_h^4 +$$
$$689\,055\,k^2\,q^4\,\eta\,d_h^4 + 767\,304\,k\,q^5\,\eta\,d_h^4 + 272\,951\,q^6\,\eta\,d_h^4 + 496\,k^5\,\eta^2\,d_h^4 + 32\,518\,k^4\,q\,\eta^2\,d_h^4 +$$
$$408\,772\,k^3\,q^2\,\eta^2\,d_h^4 + 1\,664\,322\,k^2\,q^3\,\eta^2\,d_h^4 + 2\,488\,378\,k\,q^4\,\eta^2\,d_h^4 + 1\,146\,226\,q^5\,\eta^2\,d_h^4 +$$
$$10\,378\,k^4\,\eta^3\,d_h^4 + 284\,136\,k^3\,q\,\eta^3\,d_h^4 + 1\,873\,542\,k^2\,q^2\,\eta^3\,d_h^4 + 4\,004\,196\,k\,q^3\,\eta^3\,d_h^4 + 2\,472\,948\,q^4\,\eta^3\,d_h^4 +$$
$$68\,200\,k^3\,\eta^4\,d_h^4 + 971\,996\,k^2\,q\,\eta^4\,d_h^4 + 3\,338\,312\,k\,q^2\,\eta^4\,d_h^4 + 2\,937\,364\,q^3\,\eta^4\,d_h^4 + 182\,304\,k^2\,\eta^5\,d_h^4 +$$
$$1\,342\,144\,k\,q\,\eta^5\,d_h^4 + 1\,889\,056\,q^2\,\eta^5\,d_h^4 + 196\,224\,k\,\eta^6\,d_h^4 + 588\,672\,q\,\eta^6\,d_h^4 + 63\,488\,\eta^7\,d_h^4 +$$
$$288\,k^5\,q\,d_h^5 + 8547\,k^4\,q^2\,d_h^5 + 64\,918\,k^3\,q^3\,d_h^5 + 181\,398\,k^2\,q^4\,d_h^5 + 201\,810\,k\,q^5\,d_h^5 + 73\,031\,q^6\,d_h^5 +$$
$$288\,k^5\,\eta\,d_h^5 + 18\,534\,k^4\,q\,\eta\,d_h^5 + 228\,942\,k^3\,q^2\,\eta\,d_h^5 + 920\,346\,k^2\,q^3\,\eta\,d_h^5 + 1\,371\,846\,k\,q^4\,\eta\,d_h^5 +$$
$$639\,996\,q^5\,\eta\,d_h^5 + 9481\,k^4\,\eta^2\,d_h^5 + 253\,684\,k^3\,q\,\eta^2\,d_h^5 + 1\,647\,106\,k^2\,q^2\,\eta^2\,d_h^5 + 3\,501\,740\,k\,q^3\,\eta^2\,d_h^5 +$$
$$2\,182\,917\,q^4\,\eta^2\,d_h^5 + 87\,636\,k^3\,\eta^3\,d_h^5 + 1\,224\,668\,k^2\,q\,\eta^3\,d_h^5 + 4\,172\,780\,k\,q^2\,\eta^3\,d_h^5 + 3\,694\,948\,q^3\,\eta^3\,d_h^5 +$$
$$315\,672\,k^2\,\eta^4\,d_h^5 + 2\,297\,904\,k\,q\,\eta^4\,d_h^5 + 3\,244\,920\,q^2\,\eta^4\,d_h^5 + 459\,200\,k\,\eta^5\,d_h^5 + 1\,377\,600\,q\,\eta^5\,d_h^5 +$$
$$213\,248\,\eta^6\,d_h^5 + 64\,k^5\,d_h^6 + 4107\,k^4\,q\,d_h^6 + 50\,295\,k^3\,q^2\,d_h^6 + 200\,431\,k^2\,q^3\,d_h^6 + 297\,990\,k\,q^4\,d_h^6 +$$
$$140\,301\,q^5\,d_h^6 + 4427\,k^4\,\eta\,d_h^6 + 117\,018\,k^3\,q\,\eta\,d_h^6 + 752\,178\,k^2\,q^2\,\eta\,d_h^6 + 1\,592\,822\,k\,q^3\,\eta\,d_h^6 +$$
$$999\,495\,q^4\,\eta\,d_h^6 + 64\,276\,k^3\,\eta^2\,d_h^6 + 887\,050\,k^2\,q\,\eta^2\,d_h^6 + 3\,005\,404\,k\,q^2\,\eta^2\,d_h^6 + 2\,673\,046\,q^3\,\eta^2\,d_h^6 +$$
$$326\,682\,k^2\,\eta^3\,d_h^6 + 2\,359\,420\,k\,q\,\eta^3\,d_h^6 + 3\,339\,466\,q^2\,\eta^3\,d_h^6 + 643\,608\,k\,\eta^4\,d_h^6 + 1\,930\,824\,q\,\eta^4\,d_h^6 +$$
$$405\,888\,\eta^5\,d_h^6 + 828\,k^4\,d_h^7 + 21\,798\,k^3\,q\,d_h^7 + 139\,275\,k^2\,q^2\,d_h^7 + 294\,054\,k\,q^3\,d_h^7 + 185\,355\,q^4\,d_h^7 +$$
$$25\,110\,k^3\,\eta\,d_h^7 + 343\,944\,k^2\,q\,\eta\,d_h^7 + 1\,160\,712\,k\,q^2\,\eta\,d_h^7 + 1\,035\,474\,q^3\,\eta\,d_h^7 + 200\,541\,k^2\,\eta^2\,d_h^7 +$$
$$1\,440\,570\,k\,q\,\eta^2\,d_h^7 + 2\,042\,193\,q^2\,\eta^2\,d_h^7 + 559\,032\,k\,\eta^3\,d_h^7 + 1\,677\,096\,q\,\eta^3\,d_h^7 + 479\,184\,\eta^4\,d_h^7 +$$
$$4047\,k^3\,d_h^8 + 55\,242\,k^2\,q\,d_h^8 + 185\,940\,k\,q^2\,d_h^8 + 166\,191\,q^3\,d_h^8 + 67\,383\,k^2\,\eta\,d_h^8 + 482\,364\,k\,q\,\eta\,d_h^8 +$$
$$684\,513\,q^2\,\eta\,d_h^8 + 295\,554\,k\,\eta^2\,d_h^8 + 886\,662\,q\,\eta^2\,d_h^8 + 359\,376\,\eta^3\,d_h^8 + 9533\,k^2\,d_h^9 + 68\,118\,k\,q\,d_h^9 +$$
$$96\,717\,q^2\,d_h^9 + 87\,184\,k\,\eta\,d_h^9 + 261\,552\,q\,\eta\,d_h^9 + 167\,088\,\eta^2\,d_h^9 + 10\,989\,k\,d_h^{10} + 32\,967\,q\,d_h^{10} +$$
$$43\,956\,\eta\,d_h^{10} + 4995\,d_h^{11} + 16\,k^5\,q^5\,\gamma_h + 128\,k^4\,q^6\,\gamma_h + 344\,k^3\,q^7\,\gamma_h + 392\,k^2\,q^8\,\gamma_h + 184\,k\,q^9\,\gamma_h +$$
$$24\,q^{10}\,\gamma_h + 88\,k^5\,q^4\,\eta\,\gamma_h + 887\,k^4\,q^5\,\eta\,\gamma_h + 2961\,k^3\,q^6\,\eta\,\gamma_h + 4137\,k^2\,q^7\,\eta\,\gamma_h + 2375\,k\,q^8\,\eta\,\gamma_h +$$
$$400\,q^9\,\eta\,\gamma_h + 192\,k^5\,q^3\,\eta^2\,\gamma_h + 2497\,k^4\,q^4\,\eta^2\,\gamma_h + 10\,534\,k^3\,q^5\,\eta^2\,\gamma_h + 18\,274\,k^2\,q^6\,\eta^2\,\gamma_h +$$
$$12\,902\,k\,q^7\,\eta^2\,\gamma_h + 2737\,q^8\,\eta^2\,\gamma_h + 194\,k^5\,q^2\,\eta^3\,\gamma_h + 3572\,k^4\,q^3\,\eta^3\,\gamma_h + 19\,836\,k^3\,q^4\,\eta^3\,\gamma_h +$$

$$43\,704\,k^2\,q^5\,\eta^3\,\gamma_h + 38\,402\,k\,q^6\,\eta^3\,\gamma_h + 10\,164\,q^7\,\eta^3\,\gamma_h + 86\,k^5\,q\,\eta^4\,\gamma_h + 2646\,k^4\,q^2\,\eta^4\,\gamma_h +$$
$$20\,952\,k^3\,q^3\,\eta^4\,\gamma_h + 61\,084\,k^2\,q^4\,\eta^4\,\gamma_h + 68\,282\,k\,q^5\,\eta^4\,\gamma_h + 22\,598\,q^6\,\eta^4\,\gamma_h + 12\,k^5\,\eta^5\,\gamma_h +$$
$$916\,k^4\,q\,\eta^5\,\gamma_h + 12\,032\,k^3\,q^2\,\eta^5\,\gamma_h + 49\,984\,k^2\,q^3\,\eta^5\,\gamma_h + 73\,876\,k\,q^4\,\eta^5\,\gamma_h + 30\,988\,q^5\,\eta^5\,\gamma_h +$$
$$104\,k^4\,\eta^6\,\gamma_h + 3288\,k^3\,q\,\eta^6\,\gamma_h + 22\,456\,k^2\,q^2\,\eta^6\,\gamma_h + 47\,016\,k\,q^3\,\eta^6\,\gamma_h + 25\,696\,q^4\,\eta^6\,\gamma_h +$$
$$288\,k^3\,\eta^7\,\gamma_h + 4640\,k^2\,q\,\eta^7\,\gamma_h + 15\,776\,k\,q^2\,\eta^7\,\gamma_h + 11\,808\,q^3\,\eta^7\,\gamma_h + 256\,k^2\,\eta^8\,\gamma_h + 2048\,k\,q\,\eta^8\,\gamma_h +$$
$$2304\,q^2\,\eta^8\,\gamma_h + 120\,k^5\,q^4\,d_h\,\gamma_h + 1190\,k^4\,q^5\,d_h\,\gamma_h + 3896\,k^3\,q^6\,d_h\,\gamma_h + 5380\,k^2\,q^7\,d_h\,\gamma_h +$$
$$3118\,k\,q^8\,d_h\,\gamma_h + 560\,q^9\,d_h\,\gamma_h + 528\,k^5\,q^3\,\eta\,d_h\,\gamma_h + 6860\,k^4\,q^4\,\eta\,d_h\,\gamma_h + 28\,598\,k^3\,q^5\,\eta\,d_h\,\gamma_h +$$
$$49\,208\,k^2\,q^6\,\eta\,d_h\,\gamma_h + 35\,090\,k\,q^7\,\eta\,d_h\,\gamma_h + 7884\,q^8\,\eta\,d_h\,\gamma_h + 846\,k^5\,q^2\,\eta^2\,d_h\,\gamma_h +$$
$$15\,330\,k^4\,q^3\,\eta^2\,d_h\,\gamma_h + 84\,178\,k^3\,q^4\,\eta^2\,d_h\,\gamma_h + 184\,406\,k^2\,q^5\,\eta^2\,d_h\,\gamma_h + 163\,876\,k\,q^6\,\eta^2\,d_h\,\gamma_h +$$
$$45\,828\,q^7\,\eta^2\,d_h\,\gamma_h + 552\,k^5\,q\,\eta^3\,d_h\,\gamma_h + 16\,184\,k^4\,q^2\,\eta^3\,d_h\,\gamma_h + 125\,496\,k^3\,q^3\,\eta^3\,d_h\,\gamma_h +$$
$$363\,536\,k^2\,q^4\,\eta^3\,d_h\,\gamma_h + 411\,616\,k\,q^5\,\eta^3\,d_h\,\gamma_h + 144\,136\,q^6\,\eta^3\,d_h\,\gamma_h + 116\,k^5\,\eta^4\,d_h\,\gamma_h +$$
$$7786\,k^4\,q\,\eta^4\,d_h\,\gamma_h + 97\,858\,k^3\,q^2\,\eta^4\,d_h\,\gamma_h + 401\,418\,k^2\,q^3\,\eta^4\,d_h\,\gamma_h + 601\,466\,k\,q^4\,\eta^4\,d_h\,\gamma_h +$$
$$268\,476\,q^5\,\eta^4\,d_h\,\gamma_h + 1284\,k^4\,\eta^5\,d_h\,\gamma_h + 36\,524\,k^3\,q\,\eta^5\,d_h\,\gamma_h + 242\,280\,k^2\,q^2\,\eta^5\,d_h\,\gamma_h +$$
$$513\,628\,k\,q^3\,\eta^5\,d_h\,\gamma_h + 302\,380\,q^4\,\eta^5\,d_h\,\gamma_h + 4744\,k^3\,\eta^6\,d_h\,\gamma_h + 70\,616\,k^2\,q\,\eta^6\,d_h\,\gamma_h +$$
$$241\,288\,k\,q^2\,\eta^6\,d_h\,\gamma_h + 199\,384\,q^3\,\eta^6\,d_h\,\gamma_h + 6848\,k^2\,\eta^7\,d_h\,\gamma_h + 52\,480\,k\,q\,\eta^7\,d_h\,\gamma_h +$$
$$69\,056\,q^2\,\eta^7\,d_h\,\gamma_h + 3072\,k\,\eta^8\,d_h\,\gamma_h + 9216\,q\,\eta^8\,d_h\,\gamma_h + 352\,k^5\,q^3\,d_h^2\,\gamma_h + 4537\,k^4\,q^4\,d_h^2\,\gamma_h +$$
$$18\,651\,k^3\,q^5\,d_h^2\,\gamma_h + 31\,770\,k^2\,q^6\,d_h^2\,\gamma_h + 22\,755\,k\,q^7\,d_h^2\,\gamma_h + 5301\,q^8\,d_h^2\,\gamma_h + 1160\,k^5\,q^2\,\eta\,d_h^2\,\gamma_h +$$
$$20\,878\,k^4\,q^3\,\eta\,d_h^2\,\gamma_h + 113\,502\,k^3\,q^4\,\eta\,d_h^2\,\gamma_h + 246\,861\,k^2\,q^5\,\eta\,d_h^2\,\gamma_h + 220\,581\,k\,q^6\,\eta\,d_h^2\,\gamma_h +$$
$$63\,864\,q^7\,\eta\,d_h^2\,\gamma_h + 1216\,k^5\,q\,\eta^2\,d_h^2\,\gamma_h + 34\,686\,k^4\,q^2\,\eta^2\,d_h^2\,\gamma_h + 265\,256\,k^3\,q^3\,\eta^2\,d_h^2\,\gamma_h +$$
$$763\,425\,k^2\,q^4\,\eta^2\,d_h^2\,\gamma_h + 869\,994\,k\,q^5\,\eta^2\,d_h^2\,\gamma_h + 315\,381\,q^6\,\eta^2\,d_h^2\,\gamma_h + 384\,k^5\,\eta^3\,d_h^2\,\gamma_h +$$
$$23\,994\,k^4\,q\,\eta^3\,d_h^2\,\gamma_h + 293\,246\,k^3\,q^2\,\eta^3\,d_h^2\,\gamma_h + 1\,191\,084\,k^2\,q^3\,\eta^3\,d_h^2\,\gamma_h + 1\,796\,344\,k\,q^4\,\eta^3\,d_h^2\,\gamma_h +$$
$$831\,060\,q^5\,\eta^3\,d_h^2\,\gamma_h + 5600\,k^4\,\eta^4\,d_h^2\,\gamma_h + 149\,796\,k^3\,q\,\eta^4\,d_h^2\,\gamma_h + 973\,664\,k^2\,q^2\,\eta^4\,d_h^2\,\gamma_h +$$
$$2\,073\,040\,k\,q^3\,\eta^4\,d_h^2\,\gamma_h + 1\,267\,908\,q^4\,\eta^4\,d_h^2\,\gamma_h + 27\,120\,k^3\,\eta^5\,d_h^2\,\gamma_h + 384\,720\,k^2\,q\,\eta^5\,d_h^2\,\gamma_h +$$
$$1\,309\,968\,k\,q^2\,\eta^5\,d_h^2\,\gamma_h + 1\,128\,176\,q^3\,\eta^5\,d_h^2\,\gamma_h + 54\,272\,k^2\,\eta^6\,d_h^2\,\gamma_h + 403\,008\,k\,q\,\eta^6\,d_h^2\,\gamma_h +$$
$$553\,088\,q^2\,\eta^6\,d_h^2\,\gamma_h + 42\,240\,k\,\eta^7\,d_h^2\,\gamma_h + 126\,720\,q\,\eta^7\,d_h^2\,\gamma_h + 8192\,\eta^8\,d_h^2\,\gamma_h + 504\,k^5\,q^2\,d_h^3\,\gamma_h +$$
$$9072\,k^4\,q^3\,d_h^3\,\gamma_h + 48\,902\,k^3\,q^4\,d_h^3\,\gamma_h + 105\,508\,k^2\,q^5\,d_h^3\,\gamma_h + 94\,392\,k\,q^6\,d_h^3\,\gamma_h + 27\,906\,q^7\,d_h^3\,\gamma_h +$$
$$1104\,k^5\,q\,\eta\,d_h^3\,\gamma_h + 31\,216\,k^4\,q^2\,\eta\,d_h^3\,\gamma_h + 236\,764\,k^3\,q^3\,\eta\,d_h^3\,\gamma_h + 677\,222\,k^2\,q^4\,\eta\,d_h^3\,\gamma_h +$$
$$773\,632\,k\,q^5\,\eta\,d_h^3\,\gamma_h + 286\,506\,q^6\,\eta\,d_h^3\,\gamma_h + 568\,k^5\,\eta^2\,d_h^3\,\gamma_h + 34\,224\,k^4\,q\,\eta^2\,d_h^3\,\gamma_h +$$
$$411\,524\,k^3\,q^2\,\eta^2\,d_h^3\,\gamma_h + 1\,659\,112\,k^2\,q^3\,\eta^2\,d_h^3\,\gamma_h + 2\,509\,116\,k\,q^4\,\eta^2\,d_h^3\,\gamma_h + 1\,186\,544\,q^5\,\eta^2\,d_h^3\,\gamma_h +$$
$$11\,608\,k^4\,\eta^3\,d_h^3\,\gamma_h + 299\,436\,k^3\,q\,\eta^3\,d_h^3\,\gamma_h + 1\,919\,628\,k^2\,q^2\,\eta^3\,d_h^3\,\gamma_h + 4\,091\,980\,k\,q^3\,\eta^3\,d_h^3\,\gamma_h +$$
$$2\,559\,204\,q^4\,\eta^3\,d_h^3\,\gamma_h + 74\,928\,k^3\,\eta^4\,d_h^3\,\gamma_h + 1\,031\,328\,k^2\,q\,\eta^4\,d_h^3\,\gamma_h + 3\,496\,600\,k\,q^2\,\eta^4\,d_h^3\,\gamma_h +$$
$$3\,078\,008\,q^3\,\eta^4\,d_h^3\,\gamma_h + 199\,456\,k^2\,\eta^5\,d_h^3\,\gamma_h + 1\,451\,648\,k\,q\,\eta^5\,d_h^3\,\gamma_h + 2\,029\,088\,q^2\,\eta^5\,d_h^3\,\gamma_h +$$
$$218\,496\,k\,\eta^6\,d_h^3\,\gamma_h + 655\,488\,q\,\eta^6\,d_h^3\,\gamma_h + 73\,728\,\eta^7\,d_h^3\,\gamma_h + 352\,k^5\,q\,d_h^4\,\gamma_h + 10\,022\,k^4\,q^2\,d_h^4\,\gamma_h +$$
$$75\,762\,k^3\,q^3\,d_h^4\,\gamma_h + 215\,482\,k^2\,q^4\,d_h^4\,\gamma_h + 246\,035\,k\,q^5\,d_h^4\,\gamma_h + 92\,204\,q^6\,d_h^4\,\gamma_h + 384\,k^5\,\eta\,d_h^4\,\gamma_h +$$
$$22\,899\,k^4\,q\,\eta\,d_h^4\,\gamma_h + 273\,445\,k^3\,q^2\,\eta\,d_h^4\,\gamma_h + 1\,096\,675\,k^2\,q^3\,\eta\,d_h^4\,\gamma_h + 1\,659\,303\,k\,q^4\,\eta\,d_h^4\,\gamma_h +$$
$$794\,970\,q^5\,\eta\,d_h^4\,\gamma_h + 12\,407\,k^4\,\eta^2\,d_h^4\,\gamma_h + 313\,882\,k^3\,q\,\eta^2\,d_h^4\,\gamma_h + 1\,994\,662\,k^2\,q^2\,\eta^2\,d_h^4\,\gamma_h +$$
$$4\,251\,320\,k\,q^3\,\eta^2\,d_h^4\,\gamma_h + 2\,695\,077\,q^4\,\eta^2\,d_h^4\,\gamma_h + 112\,532\,k^3\,\eta^3\,d_h^4\,\gamma_h + 1\,519\,990\,k^2\,q\,\eta^3\,d_h^4\,\gamma_h +$$
$$5\,134\,758\,k\,q^2\,\eta^3\,d_h^4\,\gamma_h + 4\,578\,752\,q^3\,\eta^3\,d_h^4\,\gamma_h + 401\,764\,k^2\,\eta^4\,d_h^4\,\gamma_h + 2\,886\,112\,k\,q\,\eta^4\,d_h^4\,\gamma_h +$$
$$4\,074\,196\,q^2\,\eta^4\,d_h^4\,\gamma_h + 589\,248\,k\,\eta^5\,d_h^4\,\gamma_h + 1\,767\,744\,q\,\eta^5\,d_h^4\,\gamma_h + 281\,344\,\eta^6\,d_h^4\,\gamma_h + 96\,k^5\,d_h^5\,\gamma_h +$$
$$5794\,k^4\,q\,d_h^5\,\gamma_h + 69\,272\,k^3\,q^2\,d_h^5\,\gamma_h + 276\,948\,k^2\,q^3\,d_h^5\,\gamma_h + 418\,544\,k\,q^4\,d_h^5\,\gamma_h + 201\,810\,q^5\,d_h^5\,\gamma_h +$$
$$6588\,k^4\,\eta\,d_h^5\,\gamma_h + 165\,590\,k^3\,q\,\eta\,d_h^5\,\gamma_h + 1\,047\,508\,k^2\,q^2\,\eta\,d_h^5\,\gamma_h + 2\,230\,914\,k\,q^3\,\eta\,d_h^5\,\gamma_h +$$
$$1\,425\,144\,q^4\,\eta\,d_h^5\,\gamma_h + 94\,048\,k^3\,\eta^2\,d_h^5\,\gamma_h + 1\,256\,680\,k^2\,q\,\eta^2\,d_h^5\,\gamma_h + 4\,234\,132\,k\,q^2\,\eta^2\,d_h^5\,\gamma_h +$$
$$3\,804\,868\,q^3\,\eta^2\,d_h^5\,\gamma_h + 472\,516\,k^2\,\eta^3\,d_h^5\,\gamma_h + 3\,365\,832\,k\,q\,\eta^3\,d_h^5\,\gamma_h + 4\,779\,172\,q^2\,\eta^3\,d_h^5\,\gamma_h +$$

$$932\,400\,k\,\eta^4\,d_h^5\,\gamma_h + 2\,797\,200\,q\,\eta^4\,d_h^5\,\gamma_h + 598\,528\,\eta^5\,d_h^5\,\gamma_h + 1369\,k^4\,d_h^6\,\gamma_h + 34\,579\,k^3\,q\,d_h^6\,\gamma_h +$$
$$218\,582\,k^2\,q^2\,d_h^6\,\gamma_h + 465\,017\,k\,q^3\,d_h^6\,\gamma_h + 297\,990\,q^4\,d_h^6\,\gamma_h + 41\,044\,k^3\,\eta\,d_h^6\,\gamma_h + 546\,055\,k^2\,q\,\eta\,d_h^6\,\gamma_h +$$
$$1\,836\,919\,k\,q^2\,\eta\,d_h^6\,\gamma_h + 1\,657\,516\,q^3\,\eta\,d_h^6\,\gamma_h + 323\,909\,k^2\,\eta^2\,d_h^6\,\gamma_h + 2\,295\,664\,k\,q\,\eta^2\,d_h^6\,\gamma_h +$$
$$3\,270\,809\,q^2\,\eta^2\,d_h^6\,\gamma_h + 900\,440\,k\,\eta^3\,d_h^6\,\gamma_h + 2\,701\,320\,q\,\eta^3\,d_h^6\,\gamma_h + 779\,856\,\eta^4\,d_h^6\,\gamma_h +$$
$$7266\,k^3\,d_h^7\,\gamma_h + 96\,804\,k^2\,q\,d_h^7\,\gamma_h + 325\,464\,k\,q^2\,d_h^7\,\gamma_h + 294\,054\,q^3\,d_h^7\,\gamma_h + 119\,790\,k^2\,\eta\,d_h^7\,\gamma_h +$$
$$847\,068\,k\,q\,\eta\,d_h^7\,\gamma_h + 1\,208\,970\,q^2\,\eta\,d_h^7\,\gamma_h + 522\,780\,k\,\eta^2\,d_h^7\,\gamma_h + 1\,568\,340\,q\,\eta^2\,d_h^7\,\gamma_h +$$
$$638\,880\,\eta^3\,d_h^7\,\gamma_h + 18\,414\,k^2\,d_h^8\,\gamma_h + 130\,233\,k\,q\,d_h^8\,\gamma_h + 185\,940\,q^2\,d_h^8\,\gamma_h + 167\,526\,k\,\eta\,d_h^8\,\gamma_h +$$
$$502\,578\,q\,\eta\,d_h^8\,\gamma_h + 321\,576\,\eta^2\,d_h^8\,\gamma_h + 22\,706\,k\,d_h^9\,\gamma_h + 68\,118\,q\,d_h^9\,\gamma_h + 90\,824\,\eta\,d_h^9\,\gamma_h +$$
$$10\,989\,d_h^{10}\,\gamma_h + 10\,k^5\,q^4\,\gamma_h^2 + 112\,k^4\,q^5\,\gamma_h^2 + 406\,k^3\,q^6\,\gamma_h^2 + 616\,k^2\,q^7\,\gamma_h^2 + 392\,k\,q^8\,\gamma_h^2 +$$
$$80\,q^9\,\gamma_h^2 + 52\,k^5\,q^3\,\eta\,\gamma_h^2 + 701\,k^4\,q^4\,\eta\,\gamma_h^2 + 3086\,k^3\,q^5\,\eta\,\gamma_h^2 + 5664\,k^2\,q^6\,\eta\,\gamma_h^2 + 4338\,k\,q^7\,\eta\,\gamma_h^2 +$$
$$1071\,q^8\,\eta\,\gamma_h^2 + 100\,k^5\,q^2\,\eta^2\,\gamma_h^2 + 1736\,k^4\,q^3\,\eta^2\,\gamma_h^2 + 9560\,k^3\,q^4\,\eta^2\,\gamma_h^2 + 21\,606\,k^2\,q^5\,\eta^2\,\gamma_h^2 +$$
$$20\,152\,k\,q^6\,\eta^2\,\gamma_h^2 + 6030\,q^7\,\eta^2\,\gamma_h^2 + 76\,k^5\,q\,\eta^3\,\gamma_h^2 + 2030\,k^4\,q^2\,\eta^3\,\gamma_h^2 + 15\,160\,k^3\,q^3\,\eta^3\,\gamma_h^2 +$$
$$43\,918\,k^2\,q^4\,\eta^3\,\gamma_h^2 + 51\,024\,k\,q^5\,\eta^3\,\gamma_h^2 + 18\,704\,q^6\,\eta^3\,\gamma_h^2 + 18\,k^5\,\eta^4\,\gamma_h^2 + 1072\,k^4\,q\,\eta^4\,\gamma_h^2 +$$
$$12\,626\,k^3\,q^2\,\eta^4\,\gamma_h^2 + 50\,562\,k^2\,q^3\,\eta^4\,\gamma_h^2 + 76\,200\,k\,q^4\,\eta^4\,\gamma_h^2 + 34\,962\,q^5\,\eta^4\,\gamma_h^2 + 192\,k^4\,\eta^5\,\gamma_h^2 +$$
$$5036\,k^3\,q\,\eta^5\,\gamma_h^2 + 32\,112\,k^2\,q^2\,\eta^5\,\gamma_h^2 + 67\,452\,k\,q^3\,\eta^5\,\gamma_h^2 + 40\,216\,q^4\,\eta^5\,\gamma_h^2 + 696\,k^3\,\eta^6\,\gamma_h^2 +$$
$$9928\,k^2\,q\,\eta^6\,\gamma_h^2 + 33\,368\,k\,q^2\,\eta^6\,\gamma_h^2 + 27\,624\,q^3\,\eta^6\,\gamma_h^2 + 1024\,k^2\,\eta^7\,\gamma_h^2 + 7808\,k\,q\,\eta^7\,\gamma_h^2 +$$
$$10\,240\,q^2\,\eta^7\,\gamma_h^2 + 512\,k\,\eta^8\,\gamma_h^2 + 1536\,q\,\eta^8\,\gamma_h^2 + 62\,k^5\,q^3\,d_h\,\gamma_h^2 + 865\,k^4\,q^4\,d_h\,\gamma_h^2 + 3828\,k^3\,q^5\,d_h\,\gamma_h^2 +$$
$$7005\,k^2\,q^6\,d_h\,\gamma_h^2 + 5380\,k\,q^7\,d_h\,\gamma_h^2 + 1359\,q^8\,d_h\,\gamma_h^2 + 238\,k^5\,q^2\,\eta\,d_h\,\gamma_h^2 + 4306\,k^4\,q^3\,\eta\,d_h\,\gamma_h^2 +$$
$$24\,132\,k^3\,q^4\,\eta\,d_h\,\gamma_h^2 + 54\,884\,k^2\,q^5\,\eta\,d_h\,\gamma_h^2 + 51\,652\,k\,q^6\,\eta\,d_h\,\gamma_h^2 + 15\,912\,q^7\,\eta\,d_h\,\gamma_h^2 +$$
$$290\,k^5\,q\,\eta^2\,d_h\,\gamma_h^2 + 7830\,k^4\,q^2\,\eta^2\,d_h\,\gamma_h^2 + 59\,182\,k^3\,q^3\,\eta^2\,d_h\,\gamma_h^2 + 173\,073\,k^2\,q^4\,\eta^2\,d_h\,\gamma_h^2 +$$
$$203\,768\,k\,q^5\,\eta^2\,d_h\,\gamma_h^2 + 77\,265\,q^6\,\eta^2\,d_h\,\gamma_h^2 + 102\,k^5\,\eta^3\,d_h\,\gamma_h^2 + 5890\,k^4\,q\,\eta^3\,d_h\,\gamma_h^2 +$$
$$69\,058\,k^3\,q^2\,\eta^3\,d_h\,\gamma_h^2 + 278\,078\,k^2\,q^3\,\eta^3\,d_h\,\gamma_h^2 + 425\,306\,k\,q^4\,\eta^3\,d_h\,\gamma_h^2 + 202\,614\,q^5\,\eta^3\,d_h\,\gamma_h^2 +$$
$$1466\,k^4\,\eta^4\,d_h\,\gamma_h^2 + 37\,168\,k^3\,q\,\eta^4\,d_h\,\gamma_h^2 + 235\,680\,k^2\,q^2\,\eta^4\,d_h\,\gamma_h^2 + 501\,176\,k\,q^3\,\eta^4\,d_h\,\gamma_h^2 +$$
$$311\,218\,q^4\,\eta^4\,d_h\,\gamma_h^2 + 7004\,k^3\,\eta^5\,d_h\,\gamma_h^2 + 96\,732\,k^2\,q\,\eta^5\,d_h\,\gamma_h^2 + 326\,164\,k\,q^2\,\eta^5\,d_h\,\gamma_h^2 +$$
$$281\,844\,q^3\,\eta^5\,d_h\,\gamma_h^2 + 14\,032\,k^2\,\eta^6\,d_h\,\gamma_h^2 + 103\,840\,k\,q\,\eta^6\,d_h\,\gamma_h^2 + 141\,904\,q^2\,\eta^6\,d_h\,\gamma_h^2 +$$
$$11\,136\,k\,\eta^7\,d_h\,\gamma_h^2 + 33\,408\,q\,\eta^7\,d_h\,\gamma_h^2 + 2048\,\eta^8\,d_h\,\gamma_h^2 + 140\,k^5\,q^2\,d_h^2\,\gamma_h^2 + 2624\,k^4\,q^3\,d_h^2\,\gamma_h^2 +$$
$$14\,835\,k^3\,q^4\,d_h^2\,\gamma_h^2 + 33\,708\,k^2\,q^5\,d_h^2\,\gamma_h^2 + 31\,770\,k\,q^6\,d_h^2\,\gamma_h^2 + 9927\,q^7\,d_h^2\,\gamma_h^2 + 352\,k^5\,q\,\eta\,d_h^2\,\gamma_h^2 +$$
$$9734\,k^4\,q^2\,\eta\,d_h^2\,\gamma_h^2 + 74\,460\,k^3\,q^3\,\eta\,d_h^2\,\gamma_h^2 + 218\,826\,k^2\,q^4\,\eta\,d_h^2\,\gamma_h^2 + 259\,338\,k\,q^5\,\eta\,d_h^2\,\gamma_h^2 +$$
$$100\,314\,q^6\,\eta\,d_h^2\,\gamma_h^2 + 204\,k^5\,\eta^2\,d_h^2\,\gamma_h^2 + 11\,546\,k^4\,q\,\eta^2\,d_h^2\,\gamma_h^2 + 135\,370\,k^3\,q^2\,\eta^2\,d_h^2\,\gamma_h^2 +$$
$$547\,228\,k^2\,q^3\,\eta^2\,d_h^2\,\gamma_h^2 + 844\,512\,k\,q^4\,\eta^2\,d_h^2\,\gamma_h^2 + 412\,020\,q^5\,\eta^2\,d_h^2\,\gamma_h^2 + 4176\,k^4\,\eta^3\,d_h^2\,\gamma_h^2 +$$
$$103\,096\,k^3\,q\,\eta^3\,d_h^2\,\gamma_h^2 + 650\,520\,k^2\,q^2\,\eta^3\,d_h^2\,\gamma_h^2 + 1\,393\,812\,k\,q^3\,\eta^3\,d_h^2\,\gamma_h^2 + 888\,408\,q^4\,\eta^3\,d_h^2\,\gamma_h^2 +$$
$$26\,744\,k^3\,\eta^4\,d_h^2\,\gamma_h^2 + 359\,692\,k^2\,q\,\eta^4\,d_h^2\,\gamma_h^2 + 1\,213\,012\,k\,q^2\,\eta^4\,d_h^2\,\gamma_h^2 + 1\,076\,152\,q^3\,\eta^4\,d_h^2\,\gamma_h^2 +$$
$$71\,040\,k^2\,\eta^5\,d_h^2\,\gamma_h^2 + 514\,176\,k\,q\,\eta^5\,d_h^2\,\gamma_h^2 + 718\,464\,q^2\,\eta^5\,d_h^2\,\gamma_h^2 + 78\,336\,k\,\eta^6\,d_h^2\,\gamma_h^2 +$$
$$235\,008\,q\,\eta^6\,d_h^2\,\gamma_h^2 + 26\,112\,\eta^7\,d_h^2\,\gamma_h^2 + 136\,k^5\,q\,d_h^3\,\gamma_h^2 + 3904\,k^4\,q^2\,d_h^3\,\gamma_h^2 + 30\,232\,k^3\,q^3\,d_h^3\,\gamma_h^2 +$$
$$88\,955\,k^2\,q^4\,d_h^3\,\gamma_h^2 + 105\,508\,k\,q^5\,d_h^3\,\gamma_h^2 + 41\,155\,q^6\,d_h^3\,\gamma_h^2 + 168\,k^5\,\eta\,d_h^3\,\gamma_h^2 + 9584\,k^4\,q\,\eta\,d_h^3\,\gamma_h^2 +$$
$$113\,196\,k^3\,q^2\,\eta\,d_h^3\,\gamma_h^2 + 459\,132\,k^2\,q^3\,\eta\,d_h^3\,\gamma_h^2 + 711\,738\,k\,q^4\,\eta\,d_h^3\,\gamma_h^2 + 351\,930\,q^5\,\eta\,d_h^3\,\gamma_h^2 +$$
$$5554\,k^4\,\eta^2\,d_h^3\,\gamma_h^2 + 135\,404\,k^3\,q\,\eta^2\,d_h^3\,\gamma_h^2 + 852\,646\,k^2\,q^2\,\eta^2\,d_h^3\,\gamma_h^2 + 1\,835\,328\,k\,q^3\,\eta^2\,d_h^3\,\gamma_h^2 +$$
$$1\,188\,996\,q^4\,\eta^2\,d_h^3\,\gamma_h^2 + 50\,336\,k^3\,\eta^3\,d_h^3\,\gamma_h^2 + 665\,276\,k^2\,q\,\eta^3\,d_h^3\,\gamma_h^2 + 2\,242\,824\,k\,q^2\,\eta^3\,d_h^3\,\gamma_h^2 +$$
$$2\,023\,260\,q^3\,\eta^3\,d_h^3\,\gamma_h^2 + 179\,308\,k^2\,\eta^4\,d_h^3\,\gamma_h^2 + 1\,278\,712\,k\,q\,\eta^4\,d_h^3\,\gamma_h^2 + 1\,810\,684\,q^2\,\eta^4\,d_h^3\,\gamma_h^2 +$$
$$263\,680\,k\,\eta^5\,d_h^3\,\gamma_h^2 + 791\,040\,q\,\eta^5\,d_h^3\,\gamma_h^2 + 125\,696\,\eta^6\,d_h^3\,\gamma_h^2 + 48\,k^5\,d_h^4\,\gamma_h^2 + 2846\,k^4\,q\,d_h^4\,\gamma_h^2 +$$
$$34\,134\,k^3\,q^2\,d_h^4\,\gamma_h^2 + 138\,912\,k^2\,q^3\,d_h^4\,\gamma_h^2 + 215\,482\,k\,q^4\,d_h^4\,\gamma_h^2 + 107\,040\,q^5\,d_h^4\,\gamma_h^2 + 3465\,k^4\,\eta\,d_h^4\,\gamma_h^2 +$$
$$84\,678\,k^3\,q\,\eta\,d_h^4\,\gamma_h^2 + 534\,026\,k^2\,q^2\,\eta\,d_h^4\,\gamma_h^2 + 1\,152\,446\,k\,q^3\,\eta\,d_h^4\,\gamma_h^2 + 753\,135\,q^4\,\eta\,d_h^4\,\gamma_h^2 +$$
$$49\,904\,k^3\,\eta^2\,d_h^4\,\gamma_h^2 + 653\,786\,k^2\,q\,\eta^2\,d_h^4\,\gamma_h^2 + 2\,204\,150\,k\,q^2\,\eta^2\,d_h^4\,\gamma_h^2 + 2\,008\,744\,q^3\,\eta^2\,d_h^4\,\gamma_h^2 +$$

$$250\,568\,k^2\,\eta^3\,d_h^4\,\gamma_h^2 + 1\,770\,352\,k\,q\,\eta^3\,d_h^4\,\gamma_h^2 + 2\,527\,688\,q^2\,\eta^3\,d_h^4\,\gamma_h^2 + 494\,784\,k\,\eta^4\,d_h^4\,\gamma_h^2 +$$
$$1\,484\,352\,q\,\eta^4\,d_h^4\,\gamma_h^2 + 317\,824\,\eta^5\,d_h^4\,\gamma_h^2 + 813\,k^4\,d_h^5\,\gamma_h^2 + 20\,224\,k^3\,q\,d_h^5\,\gamma_h^2 + 128\,215\,k^2\,q^2\,d_h^5\,\gamma_h^2 +$$
$$276\,948\,k\,q^3\,d_h^5\,\gamma_h^2 + 181\,398\,q^4\,d_h^5\,\gamma_h^2 + 24\,912\,k^3\,\eta\,d_h^5\,\gamma_h^2 + 326\,092\,k^2\,q\,\eta\,d_h^5\,\gamma_h^2 +$$
$$1\,100\,120\,k\,q^2\,\eta\,d_h^5\,\gamma_h^2 + 1\,007\,832\,q^3\,\eta\,d_h^5\,\gamma_h^2 + 197\,137\,k^2\,\eta^2\,d_h^5\,\gamma_h^2 + 1\,385\,926\,k\,q\,\eta^2\,d_h^5\,\gamma_h^2 +$$
$$1\,988\,629\,q^2\,\eta^2\,d_h^5\,\gamma_h^2 + 547\,992\,k\,\eta^3\,d_h^5\,\gamma_h^2 + 1\,643\,976\,q\,\eta^3\,d_h^5\,\gamma_h^2 + 474\,768\,\eta^4\,d_h^5\,\gamma_h^2 +$$
$$4909\,k^3\,d_h^6\,\gamma_h^2 + 64\,700\,k^2\,q\,d_h^6\,\gamma_h^2 + 218\,582\,k\,q^2\,d_h^6\,\gamma_h^2 + 200\,431\,q^3\,d_h^6\,\gamma_h^2 + 81\,600\,k^2\,\eta\,d_h^6\,\gamma_h^2 +$$
$$572\,902\,k\,q\,\eta\,d_h^6\,\gamma_h^2 + 824\,040\,q^2\,\eta\,d_h^6\,\gamma_h^2 + 356\,280\,k\,\eta^2\,d_h^6\,\gamma_h^2 + 1\,068\,840\,q\,\eta^2\,d_h^6\,\gamma_h^2 +$$
$$435\,200\,\eta^3\,d_h^6\,\gamma_h^2 + 13\,761\,k^2\,d_h^7\,\gamma_h^2 + 96\,804\,k\,q\,d_h^7\,\gamma_h^2 + 139\,275\,q^2\,d_h^7\,\gamma_h^2 + 125\,514\,k\,\eta\,d_h^7\,\gamma_h^2 +$$
$$376\,542\,q\,\eta\,d_h^7\,\gamma_h^2 + 240\,744\,\eta^2\,d_h^7\,\gamma_h^2 + 18\,414\,k\,d_h^8\,\gamma_h^2 + 55\,242\,q\,d_h^8\,\gamma_h^2 + 73\,656\,\eta\,d_h^8\,\gamma_h^2 +$$
$$9533\,d_h^9\,\gamma_h^2 + 2\,k^5\,q^3\,\gamma_h^3 + 38\,k^4\,q^4\,\gamma_h^3 + 198\,k^3\,q^5\,\gamma_h^3 + 406\,k^2\,q^6\,\gamma_h^3 + 344\,k\,q^7\,\gamma_h^3 + 96\,q^8\,\gamma_h^3 +$$
$$10\,k^5\,q^2\,\eta\,\gamma_h^3 + 216\,k^4\,q^3\,\eta\,\gamma_h^3 + 1340\,k^3\,q^4\,\eta\,\gamma_h^3 + 3301\,k^2\,q^5\,\eta\,\gamma_h^3 + 3353\,k\,q^6\,\eta\,\gamma_h^3 +$$
$$1122\,q^7\,\eta\,\gamma_h^3 + 16\,k^5\,q\,\eta^2\,\gamma_h^3 + 452\,k^4\,q^2\,\eta^2\,\gamma_h^3 + 3556\,k^3\,q^3\,\eta^2\,\gamma_h^3 + 10\,847\,k^2\,q^4\,\eta^2\,\gamma_h^3 +$$
$$13\,436\,k\,q^5\,\eta^2\,\gamma_h^3 + 5431\,q^6\,\eta^2\,\gamma_h^3 + 6\,k^5\,\eta^3\,\gamma_h^3 + 374\,k^4\,q\,\eta^3\,\gamma_h^3 + 4434\,k^3\,q^2\,\eta^3\,\gamma_h^3 +$$
$$18\,136\,k^2\,q^3\,\eta^3\,\gamma_h^3 + 28\,516\,k\,q^4\,\eta^3\,\gamma_h^3 + 14\,206\,q^5\,\eta^3\,\gamma_h^3 + 94\,k^4\,\eta^4\,\gamma_h^3 + 2484\,k^3\,q\,\eta^4\,\gamma_h^3 +$$
$$15\,876\,k^2\,q^2\,\eta^4\,\gamma_h^3 + 34\,152\,k\,q^3\,\eta^4\,\gamma_h^3 + 21\,758\,q^4\,\eta^4\,\gamma_h^3 + 460\,k^3\,\eta^5\,\gamma_h^3 + 6604\,k^2\,q\,\eta^5\,\gamma_h^3 +$$
$$22\,436\,k\,q^2\,\eta^5\,\gamma_h^3 + 19\,524\,q^3\,\eta^5\,\gamma_h^3 + 912\,k^2\,\eta^6\,\gamma_h^3 + 7008\,k\,q\,\eta^6\,\gamma_h^3 + 9488\,q^2\,\eta^6\,\gamma_h^3 + 640\,k\,\eta^7\,\gamma_h^3 +$$
$$1920\,q\,\eta^7\,\gamma_h^3 + 10\,k^5\,q^2\,d_h\,\gamma_h^3 + 240\,k^4\,q^3\,d_h\,\gamma_h^3 + 1542\,k^3\,q^4\,d_h\,\gamma_h^3 + 3828\,k^2\,q^5\,d_h\,\gamma_h^3 +$$
$$3896\,k\,q^6\,d_h\,\gamma_h^3 + 1314\,q^7\,d_h\,\gamma_h^3 + 32\,k^5\,q\,\eta\,d_h\,\gamma_h^3 + 1004\,k^4\,q^2\,\eta\,d_h\,\gamma_h^3 + 8262\,k^3\,q^3\,\eta\,d_h\,\gamma_h^3 +$$
$$25\,726\,k^2\,q^4\,\eta\,d_h\,\gamma_h^3 + 32\,280\,k\,q^5\,\eta\,d_h\,\gamma_h^3 + 13\,294\,q^6\,\eta\,d_h\,\gamma_h^3 + 22\,k^5\,\eta^2\,d_h\,\gamma_h^3 + 1330\,k^4\,q\,\eta^2\,d_h\,\gamma_h^3 +$$
$$16\,054\,k^3\,q^2\,\eta^2\,d_h\,\gamma_h^3 + 66\,754\,k^2\,q^3\,\eta^2\,d_h\,\gamma_h^3 + 106\,734\,k\,q^4\,\eta^2\,d_h\,\gamma_h^3 + 54\,554\,q^5\,\eta^2\,d_h\,\gamma_h^3 +$$
$$508\,k^4\,\eta^3\,d_h\,\gamma_h^3 + 12\,852\,k^3\,q\,\eta^3\,d_h\,\gamma_h^3 + 82\,012\,k^2\,q^2\,\eta^3\,d_h\,\gamma_h^3 + 178\,796\,k\,q^3\,\eta^3\,d_h\,\gamma_h^3 +$$
$$117\,384\,q^4\,\eta^3\,d_h\,\gamma_h^3 + 3380\,k^3\,\eta^4\,d_h\,\gamma_h^3 + 46\,300\,k^2\,q\,\eta^4\,d_h\,\gamma_h^3 + 157\,340\,k\,q^2\,\eta^4\,d_h\,\gamma_h^3 +$$
$$141\,428\,q^3\,\eta^4\,d_h\,\gamma_h^3 + 9040\,k^2\,\eta^5\,d_h\,\gamma_h^3 + 66\,496\,k\,q\,\eta^5\,d_h\,\gamma_h^3 + 92\,880\,q^2\,\eta^5\,d_h\,\gamma_h^3 + 9600\,k\,\eta^6\,d_h\,\gamma_h^3 +$$
$$28\,800\,q\,\eta^6\,d_h\,\gamma_h^3 + 2560\,\eta^7\,d_h\,\gamma_h^3 + 16\,k^5\,q\,d_h^2\,\gamma_h^3 + 554\,k^4\,q^2\,d_h^2\,\gamma_h^3 + 4722\,k^3\,q^3\,d_h^2\,\gamma_h^3 +$$
$$14\,835\,k^2\,q^4\,d_h^2\,\gamma_h^3 + 18\,651\,k\,q^5\,d_h^2\,\gamma_h^3 + 7717\,q^6\,d_h^2\,\gamma_h^3 + 24\,k^5\,\eta\,d_h^2\,\gamma_h^3 + 1512\,k^4\,q\,\eta\,d_h^2\,\gamma_h^3 +$$
$$18\,768\,k^3\,q^2\,\eta\,d_h^2\,\gamma_h^3 + 79\,110\,k^2\,q^3\,\eta\,d_h^2\,\gamma_h^3 + 127\,692\,k\,q^4\,\eta\,d_h^2\,\gamma_h^3 + 66\,186\,q^5\,\eta\,d_h^2\,\gamma_h^3 +$$
$$950\,k^4\,\eta^2\,d_h^2\,\gamma_h^3 + 23\,714\,k^3\,q\,\eta^2\,d_h^2\,\gamma_h^3 + 151\,772\,k^2\,q^2\,\eta^2\,d_h^2\,\gamma_h^3 + 334\,048\,k\,q^3\,\eta^2\,d_h^2\,\gamma_h^3 +$$
$$223\,608\,q^4\,\eta^2\,d_h^2\,\gamma_h^3 + 9104\,k^3\,\eta^3\,d_h^2\,\gamma_h^3 + 121\,458\,k^2\,q\,\eta^3\,d_h^2\,\gamma_h^3 + 413\,170\,k\,q^2\,\eta^3\,d_h^2\,\gamma_h^3 +$$
$$379\,420\,q^3\,\eta^3\,d_h^2\,\gamma_h^3 + 32\,956\,k^2\,\eta^4\,d_h^2\,\gamma_h^3 + 236\,592\,k\,q\,\eta^4\,d_h^2\,\gamma_h^3 + 336\,652\,q^2\,\eta^4\,d_h^2\,\gamma_h^3 +$$
$$47\,872\,k\,\eta^5\,d_h^2\,\gamma_h^3 + 143\,616\,q\,\eta^5\,d_h^2\,\gamma_h^3 + 21\,248\,\eta^6\,d_h^2\,\gamma_h^3 + 8\,k^5\,d_h^3\,\gamma_h^3 + 552\,k^4\,q\,d_h^3\,\gamma_h^3 +$$
$$7100\,k^3\,q^2\,d_h^3\,\gamma_h^3 + 30\,232\,k^2\,q^3\,d_h^3\,\gamma_h^3 + 48\,902\,k\,q^4\,d_h^3\,\gamma_h^3 + 25\,410\,q^5\,d_h^3\,\gamma_h^3 + 736\,k^4\,\eta\,d_h^3\,\gamma_h^3 +$$
$$18\,592\,k^3\,q\,\eta\,d_h^3\,\gamma_h^3 + 119\,856\,k^2\,q^2\,\eta\,d_h^3\,\gamma_h^3 + 265\,376\,k\,q^3\,\eta\,d_h^3\,\gamma_h^3 + 179\,436\,q^4\,\eta\,d_h^3\,\gamma_h^3 +$$
$$11\,440\,k^3\,\eta^2\,d_h^3\,\gamma_h^3 + 150\,888\,k^2\,q\,\eta^2\,d_h^3\,\gamma_h^3 + 514\,172\,k\,q^2\,\eta^2\,d_h^3\,\gamma_h^3 + 478\,492\,q^3\,\eta^2\,d_h^3\,\gamma_h^3 +$$
$$58\,812\,k^2\,\eta^3\,d_h^3\,\gamma_h^3 + 416\,424\,k\,q\,\eta^3\,d_h^3\,\gamma_h^3 + 599\,452\,q^2\,\eta^3\,d_h^3\,\gamma_h^3 + 115\,920\,k\,\eta^4\,d_h^3\,\gamma_h^3 +$$
$$347\,760\,q\,\eta^4\,d_h^3\,\gamma_h^3 + 72\,192\,\eta^5\,d_h^3\,\gamma_h^3 + 200\,k^4\,d_h^4\,\gamma_h^3 + 5236\,k^3\,q\,d_h^4\,\gamma_h^3 + 34\,134\,k^2\,q^2\,d_h^4\,\gamma_h^3 +$$
$$75\,762\,k\,q^3\,d_h^4\,\gamma_h^3 + 51\,285\,q^4\,d_h^4\,\gamma_h^3 + 6770\,k^3\,\eta\,d_h^4\,\gamma_h^3 + 89\,357\,k^2\,q\,\eta\,d_h^4\,\gamma_h^3 + 305\,209\,k\,q^2\,\eta\,d_h^4\,\gamma_h^3 +$$
$$285\,910\,q^3\,\eta\,d_h^4\,\gamma_h^3 + 55\,279\,k^2\,\eta^2\,d_h^4\,\gamma_h^3 + 388\,740\,k\,q\,\eta^2\,d_h^4\,\gamma_h^3 + 563\,499\,q^2\,\eta^2\,d_h^4\,\gamma_h^3 +$$
$$154\,280\,k\,\eta^3\,d_h^4\,\gamma_h^3 + 462\,840\,q\,\eta^3\,d_h^4\,\gamma_h^3 + 131\,568\,\eta^4\,d_h^4\,\gamma_h^3 + 1514\,k^3\,d_h^5\,\gamma_h^3 + 20\,224\,k^2\,q\,d_h^5\,\gamma_h^3 +$$
$$69\,272\,k\,q^2\,d_h^5\,\gamma_h^3 + 64\,918\,q^3\,d_h^5\,\gamma_h^3 + 26\,202\,k^2\,\eta\,d_h^5\,\gamma_h^3 + 183\,984\,k\,q\,\eta\,d_h^5\,\gamma_h^3 + 267\,582\,q^2\,\eta\,d_h^5\,\gamma_h^3 +$$
$$115\,396\,k\,\eta^2\,d_h^5\,\gamma_h^3 + 346\,188\,q\,\eta^2\,d_h^5\,\gamma_h^3 + 139\,744\,\eta^3\,d_h^5\,\gamma_h^3 + 4909\,k^2\,d_h^6\,\gamma_h^3 + 34\,579\,k\,q\,d_h^6\,\gamma_h^3 +$$
$$50\,295\,q^2\,d_h^6\,\gamma_h^3 + 45\,386\,k\,\eta\,d_h^6\,\gamma_h^3 + 136\,158\,q\,\eta\,d_h^6\,\gamma_h^3 + 86\,696\,\eta^2\,d_h^6\,\gamma_h^3 + 7266\,k\,d_h^7\,\gamma_h^3 +$$
$$21\,798\,q\,d_h^7\,\gamma_h^3 + 29\,064\,\eta\,d_h^7\,\gamma_h^3 + 4047\,d_h^8\,\gamma_h^3 + 4\,k^4\,q^3\,\gamma_h^4 + 38\,k^3\,q^4\,\gamma_h^4 + 112\,k^2\,q^5\,\gamma_h^4 +$$
$$128\,k\,q^6\,\gamma_h^4 + 48\,q^7\,\gamma_h^4 + 20\,k^4\,q^2\,\eta\,\gamma_h^4 + 226\,k^3\,q^3\,\eta\,\gamma_h^4 + 803\,k^2\,q^4\,\eta\,\gamma_h^4 + 1102\,k\,q^5\,\eta\,\gamma_h^4 +$$

$$495\,q^6\,\eta\,\gamma_h^4 + 32\,k^4\,q\,\eta^2\,\gamma_h^4 + 490\,k^3\,q^2\,\eta^2\,\gamma_h^4 + 2226\,k^2\,q^3\,\eta^2\,\gamma_h^4 + 3768\,k\,q^4\,\eta^2\,\gamma_h^4 + 2044\,q^5\,\eta^2\,\gamma_h^4 +$$
$$12\,k^4\,\eta^3\,\gamma_h^4 + 416\,k^3\,q\,\eta^3\,\gamma_h^4 + 2862\,k^2\,q^2\,\eta^3\,\gamma_h^4 + 6448\,k\,q^3\,\eta^3\,\gamma_h^4 + 4362\,q^4\,\eta^3\,\gamma_h^4 + 104\,k^3\,\eta^4\,\gamma_h^4 +$$
$$1624\,k^2\,q\,\eta^4\,\gamma_h^4 + 5668\,k\,q^2\,\eta^4\,\gamma_h^4 + 5100\,q^3\,\eta^4\,\gamma_h^4 + 288\,k^2\,\eta^5\,\gamma_h^4 + 2272\,k\,q\,\eta^5\,\gamma_h^4 + 3104\,q^2\,\eta^5\,\gamma_h^4 +$$
$$256\,k\,\eta^6\,\gamma_h^4 + 768\,q\,\eta^6\,\gamma_h^4 + 20\,k^4\,q^2\,d_h\,\gamma_h^4 + 240\,k^3\,q^3\,d_h\,\gamma_h^4 + 865\,k^2\,q^4\,d_h\,\gamma_h^4 + 1190\,k\,q^5\,d_h\,\gamma_h^4 +$$
$$535\,q^6\,d_h\,\gamma_h^4 + 64\,k^4\,q\,\eta\,d_h\,\gamma_h^4 + 1046\,k^3\,q^2\,\eta\,d_h\,\gamma_h^4 + 4886\,k^2\,q^3\,\eta\,d_h\,\gamma_h^4 + 8426\,k\,q^4\,\eta\,d_h\,\gamma_h^4 +$$
$$4662\,q^5\,\eta\,d_h\,\gamma_h^4 + 44\,k^4\,\eta^2\,d_h\,\gamma_h^4 + 1430\,k^3\,q\,\eta^2\,d_h\,\gamma_h^4 + 9876\,k^2\,q^2\,\eta^2\,d_h\,\gamma_h^4 + 22\,650\,k\,q^3\,\eta^2\,d_h\,\gamma_h^4 +$$
$$15\,804\,q^4\,\eta^2\,d_h\,\gamma_h^4 + 558\,k^3\,\eta^3\,d_h\,\gamma_h^4 + 8126\,k^2\,q\,\eta^3\,d_h\,\gamma_h^4 + 28\,382\,k\,q^2\,\eta^3\,d_h\,\gamma_h^4 + 26\,518\,q^3\,\eta^3\,d_h\,\gamma_h^4 +$$
$$2152\,k^2\,\eta^4\,d_h\,\gamma_h^4 + 16\,016\,k\,q\,\eta^4\,d_h\,\gamma_h^4 + 22\,744\,q^2\,\eta^4\,d_h\,\gamma_h^4 + 2976\,k\,\eta^5\,d_h\,\gamma_h^4 + 8928\,q\,\eta^5\,d_h\,\gamma_h^4 +$$
$$1024\,\eta^6\,d_h\,\gamma_h^4 + 32\,k^4\,q\,d_h^2\,\gamma_h^4 + 554\,k^3\,q^2\,d_h^2\,\gamma_h^4 + 2624\,k^2\,q^3\,d_h^2\,\gamma_h^4 + 4537\,k\,q^4\,d_h^2\,\gamma_h^4 +$$
$$2511\,q^5\,d_h^2\,\gamma_h^4 + 48\,k^4\,\eta\,d_h^2\,\gamma_h^4 + 1568\,k^3\,q\,\eta\,d_h^2\,\gamma_h^4 + 10\,940\,k^2\,q^2\,\eta\,d_h^2\,\gamma_h^4 + 25\,352\,k\,q^3\,\eta\,d_h^2\,\gamma_h^4 +$$
$$17\,958\,q^4\,\eta\,d_h^2\,\gamma_h^4 + 1014\,k^3\,\eta^2\,d_h^2\,\gamma_h^4 + 14\,326\,k^2\,q\,\eta^2\,d_h^2\,\gamma_h^4 + 50\,156\,k\,q^2\,\eta^2\,d_h^2\,\gamma_h^4 + 47\,904\,q^3\,\eta^2\,d_h^2\,\gamma_h^4 +$$
$$5638\,k^2\,\eta^3\,d_h^2\,\gamma_h^4 + 40\,788\,k\,q\,\eta^3\,d_h^2\,\gamma_h^4 + 59\,158\,q^2\,\eta^3\,d_h^2\,\gamma_h^4 + 11\,016\,k\,\eta^4\,d_h^2\,\gamma_h^4 + 33\,048\,q\,\eta^4\,d_h^2\,\gamma_h^4 +$$
$$6272\,\eta^5\,d_h^2\,\gamma_h^4 + 16\,k^4\,d_h^3\,\gamma_h^4 + 552\,k^3\,q\,d_h^3\,\gamma_h^4 + 3904\,k^2\,q^2\,d_h^3\,\gamma_h^4 + 9072\,k\,q^3\,d_h^3\,\gamma_h^4 + 6426\,q^4\,d_h^3\,\gamma_h^4 +$$
$$760\,k^3\,\eta\,d_h^3\,\gamma_h^4 + 10\,672\,k^2\,q\,\eta\,d_h^3\,\gamma_h^4 + 37\,472\,k\,q^2\,\eta\,d_h^3\,\gamma_h^4 + 36\,160\,q^3\,\eta\,d_h^3\,\gamma_h^4 + 6786\,k^2\,\eta^2\,d_h^3\,\gamma_h^4 +$$
$$48\,428\,k\,q\,\eta^2\,d_h^3\,\gamma_h^4 + 71\,066\,q^2\,\eta^2\,d_h^3\,\gamma_h^4 + 19\,120\,k\,\eta^3\,d_h^3\,\gamma_h^4 + 57\,360\,q\,\eta^3\,d_h^3\,\gamma_h^4 + 15\,648\,\eta^4\,d_h^3\,\gamma_h^4 +$$
$$200\,k^3\,d_h^4\,\gamma_h^4 + 2846\,k^2\,q\,d_h^4\,\gamma_h^4 + 10\,022\,k\,q^2\,d_h^4\,\gamma_h^4 + 9670\,q^3\,d_h^4\,\gamma_h^4 + 3825\,k^2\,\eta\,d_h^4\,\gamma_h^4 +$$
$$27\,178\,k\,q\,\eta\,d_h^4\,\gamma_h^4 + 40\,095\,q^2\,\eta\,d_h^4\,\gamma_h^4 + 17\,190\,k\,\eta^2\,d_h^4\,\gamma_h^4 + 51\,570\,q\,\eta^2\,d_h^4\,\gamma_h^4 + 20\,400\,\eta^3\,d_h^4\,\gamma_h^4 +$$
$$813\,k^2\,d_h^5\,\gamma_h^4 + 5794\,k\,q\,d_h^5\,\gamma_h^4 + 8547\,q^2\,d_h^5\,\gamma_h^4 + 7734\,k\,\eta\,d_h^5\,\gamma_h^4 + 23\,202\,q\,\eta\,d_h^5\,\gamma_h^4 +$$
$$14\,648\,\eta^2\,d_h^5\,\gamma_h^4 + 1369\,k\,d_h^6\,\gamma_h^4 + 4107\,q\,d_h^6\,\gamma_h^4 + 5476\,\eta\,d_h^6\,\gamma_h^4 + 828\,d_h^7\,\gamma_h^4 + 2\,k^3\,q^3\,\gamma_h^5 +$$
$$10\,k^2\,q^4\,\gamma_h^5 + 16\,k\,q^5\,\gamma_h^5 + 8\,q^6\,\gamma_h^5 + 10\,k^3\,q^2\,\eta\,\gamma_h^5 + 62\,k^2\,q^3\,\eta\,\gamma_h^5 + 120\,k\,q^4\,\eta\,\gamma_h^5 + 72\,q^5\,\eta\,\gamma_h^5 +$$
$$16\,k^3\,q\,\eta^2\,\gamma_h^5 + 138\,k^2\,q^2\,\eta^2\,\gamma_h^5 + 340\,k\,q^3\,\eta^2\,\gamma_h^5 + 246\,q^4\,\eta^2\,\gamma_h^5 + 6\,k^3\,\eta^3\,\gamma_h^5 + 118\,k^2\,q\,\eta^3\,\gamma_h^5 +$$
$$434\,k\,q^2\,\eta^3\,\gamma_h^5 + 402\,q^3\,\eta^3\,\gamma_h^5 + 28\,k^2\,\eta^4\,\gamma_h^5 + 232\,k\,q\,\eta^4\,\gamma_h^5 + 316\,q^2\,\eta^4\,\gamma_h^5 + 32\,k\,\eta^5\,\gamma_h^5 + 96\,q\,\eta^5\,\gamma_h^5 +$$
$$10\,k^3\,q^2\,d_h\,\gamma_h^5 + 62\,k^2\,q^3\,d_h\,\gamma_h^5 + 120\,k\,q^4\,d_h\,\gamma_h^5 + 72\,q^5\,d_h\,\gamma_h^5 + 32\,k^3\,q\,\eta\,d_h\,\gamma_h^5 + 280\,k^2\,q^2\,\eta\,d_h\,\gamma_h^5 +$$
$$704\,k\,q^3\,\eta\,d_h\,\gamma_h^5 + 528\,q^4\,\eta\,d_h\,\gamma_h^5 + 22\,k^3\,\eta^2\,d_h\,\gamma_h^5 + 390\,k^2\,q\,\eta^2\,d_h\,\gamma_h^5 + 1442\,k\,q^2\,\eta^2\,d_h\,\gamma_h^5 +$$
$$1410\,q^3\,\eta^2\,d_h\,\gamma_h^5 + 152\,k^2\,\eta^3\,d_h\,\gamma_h^5 + 1168\,k\,q\,\eta^3\,d_h\,\gamma_h^5 + 1688\,q^2\,\eta^3\,d_h\,\gamma_h^5 + 288\,k\,\eta^4\,d_h\,\gamma_h^5 +$$
$$864\,q\,\eta^4\,d_h\,\gamma_h^5 + 128\,\eta^5\,d_h\,\gamma_h^5 + 16\,k^3\,q\,d_h^2\,\gamma_h^5 + 140\,k^2\,q^2\,d_h^2\,\gamma_h^5 + 352\,k\,q^3\,d_h^2\,\gamma_h^5 + 264\,q^4\,d_h^2\,\gamma_h^5 +$$
$$24\,k^3\,\eta\,d_h^2\,\gamma_h^5 + 408\,k^2\,q\,\eta\,d_h^2\,\gamma_h^5 + 1512\,k\,q^2\,\eta\,d_h^2\,\gamma_h^5 + 1512\,q^3\,\eta\,d_h^2\,\gamma_h^5 + 268\,k^2\,\eta^2\,d_h^2\,\gamma_h^5 +$$
$$1992\,k\,q\,\eta^2\,d_h^2\,\gamma_h^5 + 2956\,q^2\,\eta^2\,d_h^2\,\gamma_h^5 + 768\,k\,\eta^3\,d_h^2\,\gamma_h^5 + 2304\,q\,\eta^3\,d_h^2\,\gamma_h^5 + 576\,\eta^4\,d_h^2\,\gamma_h^5 +$$
$$8\,k^3\,d_h^3\,\gamma_h^5 + 136\,k^2\,q\,d_h^3\,\gamma_h^5 + 504\,k\,q^2\,d_h^3\,\gamma_h^5 + 504\,q^3\,d_h^3\,\gamma_h^5 + 192\,k^2\,\eta\,d_h^3\,\gamma_h^5 + 1408\,k\,q\,\eta\,d_h^3\,\gamma_h^5 +$$
$$2112\,q^2\,\eta\,d_h^3\,\gamma_h^5 + 896\,k\,\eta^2\,d_h^3\,\gamma_h^5 + 2688\,q\,\eta^2\,d_h^3\,\gamma_h^5 + 1024\,\eta^3\,d_h^3\,\gamma_h^5 + 48\,k^2\,d_h^4\,\gamma_h^5 + 352\,k\,q\,d_h^4\,\gamma_h^5 +$$
$$528\,q^2\,d_h^4\,\gamma_h^5 + 480\,k\,\eta\,d_h^4\,\gamma_h^5 + 1440\,q\,\eta\,d_h^4\,\gamma_h^5 + 896\,\eta^2\,d_h^4\,\gamma_h^5 + 96\,k\,d_h^5\,\gamma_h^5 + 288\,q\,d_h^5\,\gamma_h^5 +$$
$$384\,\eta\,d_h^5\,\gamma_h^5 + 64\,d_h^6\,\gamma_h^5 + 24\,k^5\,q^5\,\delta_h + 159\,k^4\,q^6\,\delta_h + 354\,k^3\,q^7\,\delta_h + 351\,k^2\,q^8\,\delta_h + 160\,k\,q^9\,\delta_h +$$
$$24\,q^{10}\,\delta_h + 120\,k^5\,q^4\,\eta\,\delta_h + 1074\,k^4\,q^5\,\eta\,\delta_h + 3114\,k^3\,q^6\,\eta\,\delta_h + 3870\,k^2\,q^7\,\eta\,\delta_h + 2142\,k\,q^8\,\eta\,\delta_h +$$
$$400\,q^9\,\eta\,\delta_h + 226\,k^5\,q^3\,\eta^2\,\delta_h + 2843\,k^4\,q^4\,\eta^2\,\delta_h + 10\,982\,k^3\,q^5\,\eta^2\,\delta_h + 17\,404\,k^2\,q^6\,\eta^2\,\delta_h +$$
$$11\,872\,k\,q^7\,\eta^2\,\delta_h + 2737\,q^8\,\eta^2\,\delta_h + 198\,k^5\,q^2\,\eta^3\,\delta_h + 3742\,k^4\,q^3\,\eta^3\,\delta_h + 20\,022\,k^3\,q^4\,\eta^3\,\delta_h +$$
$$41\,526\,k^2\,q^5\,\eta^3\,\delta_h + 35\,580\,k\,q^6\,\eta^3\,\delta_h + 10\,164\,q^7\,\eta^3\,\delta_h + 80\,k^5\,q\,\eta^4\,\delta_h + 2550\,k^4\,q^2\,\eta^4\,\delta_h +$$
$$20\,164\,k^3\,q^3\,\eta^4\,\delta_h + 56\,956\,k^2\,q^4\,\eta^4\,\delta_h + 62\,964\,k\,q^5\,\eta^4\,\delta_h + 22\,598\,q^6\,\eta^4\,\delta_h + 12\,k^5\,\eta^5\,\delta_h +$$
$$840\,k^4\,q\,\eta^5\,\delta_h + 11\,012\,k^3\,q^2\,\eta^5\,\delta_h + 45\,148\,k^2\,q^3\,\eta^5\,\delta_h + 67\,008\,k\,q^4\,\eta^5\,\delta_h + 30\,988\,q^5\,\eta^5\,\delta_h +$$
$$104\,k^4\,\eta^6\,\delta_h + 2936\,k^3\,q\,\eta^6\,\delta_h + 19\,512\,k^2\,q^2\,\eta^6\,\delta_h + 41\,352\,k\,q^3\,\eta^6\,\delta_h + 25\,696\,q^4\,\eta^6\,\delta_h +$$
$$288\,k^3\,\eta^7\,\delta_h + 3936\,k^2\,q\,\eta^7\,\delta_h + 13\,152\,k\,q^2\,\eta^7\,\delta_h + 11\,808\,q^3\,\eta^7\,\delta_h + 256\,k^2\,\eta^8\,\delta_h + 1536\,k\,q\,\eta^8\,\delta_h +$$
$$2304\,q^2\,\eta^8\,\delta_h + 168\,k^5\,q^4\,d_h\,\delta_h + 1452\,k^4\,q^5\,d_h\,\delta_h + 4096\,k^3\,q^6\,d_h\,\delta_h + 5040\,k^2\,q^7\,d_h\,\delta_h +$$
$$2844\,k\,q^8\,d_h\,\delta_h + 560\,q^9\,d_h\,\delta_h + 672\,k^5\,q^3\,\eta\,d_h\,\delta_h + 8100\,k^4\,q^4\,\eta\,d_h\,\delta_h + 30\,384\,k^3\,q^5\,\eta\,d_h\,\delta_h +$$
$$47\,568\,k^2\,q^6\,\eta\,d_h\,\delta_h + 32\,832\,k\,q^7\,\eta\,d_h\,\delta_h + 7884\,q^8\,\eta\,d_h\,\delta_h + 954\,k^5\,q^2\,\eta^2\,d_h\,\delta_h +$$

$$17\,058\,k^4\,q^3\,\eta^2\,d_h\,\delta_h + 88\,194\,k^3\,q^4\,\eta^2\,d_h\,\delta_h + 180\,210\,k^2\,q^5\,\eta^2\,d_h\,\delta_h + 155\,436\,k\,q^6\,\eta^2\,d_h\,\delta_h +$$
$$45\,828\,q^7\,\eta^2\,d_h\,\delta_h + 564\,k^5\,q\,\eta^3\,d_h\,\delta_h + 16\,824\,k^4\,q^2\,\eta^3\,d_h\,\delta_h + 127\,568\,k^3\,q^3\,\eta^3\,d_h\,\delta_h +$$
$$353\,712\,k^2\,q^4\,\eta^3\,d_h\,\delta_h + 392\,076\,k\,q^5\,\eta^3\,d_h\,\delta_h + 144\,136\,q^6\,\eta^3\,d_h\,\delta_h + 116\,k^5\,\eta^4\,d_h\,\delta_h +$$
$$7688\,k^4\,q\,\eta^4\,d_h\,\delta_h + 96\,036\,k^3\,q^2\,\eta^4\,d_h\,\delta_h + 384\,940\,k^2\,q^3\,\eta^4\,d_h\,\delta_h + 571\,000\,k\,q^4\,\eta^4\,d_h\,\delta_h +$$
$$268\,476\,q^5\,\eta^4\,d_h\,\delta_h + 1284\,k^4\,\eta^5\,d_h\,\delta_h + 35\,096\,k^3\,q\,\eta^5\,d_h\,\delta_h + 228\,336\,k^2\,q^2\,\eta^5\,d_h\,\delta_h +$$
$$483\,144\,k\,q^3\,\eta^5\,d_h\,\delta_h + 302\,380\,q^4\,\eta^5\,d_h\,\delta_h + 4744\,k^3\,\eta^6\,d_h\,\delta_h + 66\,248\,k^2\,q\,\eta^6\,d_h\,\delta_h +$$
$$224\,216\,k\,q^2\,\eta^6\,d_h\,\delta_h + 199\,384\,q^3\,\eta^6\,d_h\,\delta_h + 6848\,k^2\,\eta^7\,d_h\,\delta_h + 48\,512\,k\,q\,\eta^7\,d_h\,\delta_h +$$
$$69\,056\,q^2\,\eta^7\,d_h\,\delta_h + 3072\,k\,\eta^8\,d_h\,\delta_h + 9216\,q\,\eta^8\,d_h\,\delta_h + 456\,k^5\,q^3\,d_h^2\,\delta_h + 5403\,k^4\,q^4\,d_h^2\,\delta_h +$$
$$19\,884\,k^3\,q^5\,d_h^2\,\delta_h + 30\,825\,k^2\,q^6\,d_h^2\,\delta_h + 21\,456\,k\,q^7\,d_h^2\,\delta_h + 5301\,q^8\,d_h^2\,\delta_h + 1368\,k^5\,q^2\,\eta\,d_h^2\,\delta_h +$$
$$23\,892\,k^4\,q^3\,\eta\,d_h^2\,\delta_h + 121\,032\,k^3\,q^4\,\eta\,d_h^2\,\delta_h + 244\,602\,k^2\,q^5\,\eta\,d_h^2\,\delta_h + 211\,842\,k\,q^6\,\eta\,d_h^2\,\delta_h +$$
$$63\,864\,q^7\,\eta\,d_h^2\,\delta_h + 1296\,k^5\,q\,\eta^2\,d_h^2\,\delta_h + 37\,488\,k^4\,q^2\,\eta^2\,d_h^2\,\delta_h + 277\,624\,k^3\,q^3\,\eta^2\,d_h^2\,\delta_h +$$
$$760\,065\,k^2\,q^4\,\eta^2\,d_h^2\,\delta_h + 843\,306\,k\,q^5\,\eta^2\,d_h^2\,\delta_h + 315\,381\,q^6\,\eta^2\,d_h^2\,\delta_h + 384\,k^5\,\eta^3\,d_h^2\,\delta_h +$$
$$24\,552\,k^4\,q\,\eta^3\,d_h^2\,\delta_h + 298\,440\,k^3\,q^2\,\eta^3\,d_h^2\,\delta_h + 1\,178\,628\,k^2\,q^3\,\eta^3\,d_h^2\,\delta_h + 1\,745\,496\,k\,q^4\,\eta^3\,d_h^2\,\delta_h +$$
$$831\,060\,q^5\,\eta^3\,d_h^2\,\delta_h + 5600\,k^4\,\eta^4\,d_h^2\,\delta_h + 148\,896\,k^3\,q\,\eta^4\,d_h^2\,\delta_h + 953\,316\,k^2\,q^2\,\eta^4\,d_h^2\,\delta_h +$$
$$2\,010\,088\,k\,q^3\,\eta^4\,d_h^2\,\delta_h + 1\,267\,908\,q^4\,\eta^4\,d_h^2\,\delta_h + 27\,120\,k^3\,\eta^5\,d_h^2\,\delta_h + 374\,928\,k^2\,q\,\eta^5\,d_h^2\,\delta_h +$$
$$1\,265\,808\,k\,q^2\,\eta^5\,d_h^2\,\delta_h + 1\,128\,176\,q^3\,\eta^5\,d_h^2\,\delta_h + 54\,272\,k^2\,\eta^6\,d_h^2\,\delta_h + 390\,272\,k\,q\,\eta^6\,d_h^2\,\delta_h +$$
$$553\,088\,q^2\,\eta^6\,d_h^2\,\delta_h + 42\,240\,k\,\eta^7\,d_h^2\,\delta_h + 126\,720\,q\,\eta^7\,d_h^2\,\delta_h + 8192\,\eta^8\,d_h^2\,\delta_h + 600\,k^5\,q^2\,d_h^3\,\delta_h +$$
$$10\,456\,k^4\,q^3\,d_h^3\,\delta_h + 52\,386\,k^3\,q^4\,d_h^3\,\delta_h + 105\,000\,k^2\,q^5\,d_h^3\,\delta_h + 91\,164\,k\,q^6\,d_h^3\,\delta_h + 27\,906\,q^7\,d_h^3\,\delta_h +$$
$$1200\,k^5\,q\,\eta\,d_h^3\,\delta_h + 34\,368\,k^4\,q^2\,\eta\,d_h^3\,\delta_h + 251\,368\,k^3\,q^3\,\eta\,d_h^3\,\delta_h + 682\,158\,k^2\,q^4\,\eta\,d_h^3\,\delta_h +$$
$$756\,984\,k\,q^5\,\eta\,d_h^3\,\delta_h + 286\,506\,q^6\,\eta\,d_h^3\,\delta_h + 568\,k^5\,\eta^2\,d_h^3\,\delta_h + 35\,680\,k^4\,q\,\eta^2\,d_h^3\,\delta_h +$$
$$427\,168\,k^3\,q^2\,\eta^2\,d_h^3\,\delta_h + 1\,670\,380\,k^2\,q^3\,\eta^2\,d_h^3\,\delta_h + 2\,469\,596\,k\,q^4\,\eta^2\,d_h^3\,\delta_h + 1\,186\,544\,q^5\,\eta^2\,d_h^3\,\delta_h +$$
$$11\,608\,k^4\,\eta^3\,d_h^3\,\delta_h + 303\,024\,k^3\,q\,\eta^3\,d_h^3\,\delta_h + 1\,918\,332\,k^2\,q^2\,\eta^3\,d_h^3\,\delta_h + 4\,031\,672\,k\,q^3\,\eta^3\,d_h^3\,\delta_h +$$
$$2\,559\,204\,q^4\,\eta^3\,d_h^3\,\delta_h + 74\,928\,k^3\,\eta^4\,d_h^3\,\delta_h + 1\,023\,656\,k^2\,q\,\eta^4\,d_h^3\,\delta_h + 3\,441\,392\,k\,q^2\,\eta^4\,d_h^3\,\delta_h +$$
$$3\,078\,008\,q^3\,\eta^4\,d_h^3\,\delta_h + 199\,456\,k^2\,\eta^5\,d_h^3\,\delta_h + 1\,430\,720\,k\,q\,\eta^5\,d_h^3\,\delta_h + 2\,029\,088\,q^2\,\eta^5\,d_h^3\,\delta_h +$$
$$218\,496\,k\,\eta^6\,d_h^3\,\delta_h + 655\,488\,q\,\eta^6\,d_h^3\,\delta_h + 73\,728\,\eta^7\,d_h^3\,\delta_h + 384\,k^5\,q\,d_h^4\,\delta_h + 11\,085\,k^4\,q^2\,d_h^4\,\delta_h +$$
$$80\,770\,k^3\,q^3\,d_h^4\,\delta_h + 217\,935\,k^2\,q^4\,d_h^4\,\delta_h + 241\,746\,k\,q^5\,d_h^4\,\delta_h + 92\,204\,q^6\,d_h^4\,\delta_h + 384\,k^5\,\eta\,d_h^4\,\delta_h +$$
$$24\,090\,k^4\,q\,\eta\,d_h^4\,\delta_h + 286\,650\,k^3\,q^2\,\eta\,d_h^4\,\delta_h + 1\,114\,050\,k^2\,q^3\,\eta\,d_h^4\,\delta_h + 1\,644\,600\,k\,q^4\,\eta\,d_h^4\,\delta_h +$$
$$794\,970\,q^5\,\eta\,d_h^4\,\delta_h + 12\,407\,k^4\,\eta^2\,d_h^4\,\delta_h + 320\,804\,k^3\,q\,\eta^2\,d_h^4\,\delta_h + 2\,016\,248\,k^2\,q^2\,\eta^2\,d_h^4\,\delta_h +$$
$$4\,226\,544\,k\,q^3\,\eta^2\,d_h^4\,\delta_h + 2\,695\,077\,q^4\,\eta^2\,d_h^4\,\delta_h + 112\,532\,k^3\,\eta^3\,d_h^4\,\delta_h + 1\,523\,848\,k^2\,q\,\eta^3\,d_h^4\,\delta_h +$$
$$5\,104\,228\,k\,q^2\,\eta^3\,d_h^4\,\delta_h + 4\,578\,752\,q^3\,\eta^3\,d_h^4\,\delta_h + 401\,764\,k^2\,\eta^4\,d_h^4\,\delta_h + 2\,868\,904\,k\,q\,\eta^4\,d_h^4\,\delta_h +$$
$$4\,074\,196\,q^2\,\eta^4\,d_h^4\,\delta_h + 589\,248\,k\,\eta^5\,d_h^4\,\delta_h + 1\,767\,744\,q\,\eta^5\,d_h^4\,\delta_h + 281\,344\,\eta^6\,d_h^4\,\delta_h + 96\,k^5\,d_h^5\,\delta_h +$$
$$6108\,k^4\,q\,d_h^5\,\delta_h + 72\,828\,k^3\,q^2\,d_h^5\,\delta_h + 282\,240\,k^2\,q^3\,d_h^5\,\delta_h + 416\,094\,k\,q^4\,d_h^5\,\delta_h + 201\,810\,q^5\,d_h^5\,\delta_h +$$
$$6588\,k^4\,\eta\,d_h^5\,\delta_h + 170\,088\,k^3\,q\,\eta\,d_h^5\,\delta_h + 1\,065\,204\,k^2\,q^2\,\eta\,d_h^5\,\delta_h + 2\,228\,856\,k\,q^3\,\eta\,d_h^5\,\delta_h +$$
$$1\,425\,144\,q^4\,\eta\,d_h^5\,\delta_h + 94\,048\,k^3\,\eta^2\,d_h^5\,\delta_h + 1\,267\,036\,k^2\,q\,\eta^2\,d_h^5\,\delta_h + 4\,232\,992\,k\,q^2\,\eta^2\,d_h^5\,\delta_h +$$
$$3\,804\,868\,q^3\,\eta^2\,d_h^5\,\delta_h + 472\,516\,k^2\,\eta^3\,d_h^5\,\delta_h + 3\,361\,624\,k\,q\,\eta^3\,d_h^5\,\delta_h + 4\,779\,172\,q^2\,\eta^3\,d_h^5\,\delta_h +$$
$$932\,400\,k\,\eta^4\,d_h^5\,\delta_h + 2\,797\,200\,q\,\eta^4\,d_h^5\,\delta_h + 598\,528\,\eta^5\,d_h^5\,\delta_h + 1369\,k^4\,d_h^6\,\delta_h + 35\,568\,k^3\,q\,d_h^6\,\delta_h +$$
$$222\,747\,k^2\,q^2\,d_h^6\,\delta_h + 465\,556\,k\,q^3\,d_h^6\,\delta_h + 297\,990\,q^4\,d_h^6\,\delta_h + 41\,044\,k^3\,\eta\,d_h^6\,\delta_h + 552\,198\,k^2\,q\,\eta\,d_h^6\,\delta_h +$$
$$1\,842\,162\,k\,q^2\,\eta\,d_h^6\,\delta_h + 1\,657\,516\,q^3\,\eta\,d_h^6\,\delta_h + 323\,909\,k^2\,\eta^2\,d_h^6\,\delta_h + 2\,299\,082\,k\,q\,\eta^2\,d_h^6\,\delta_h +$$
$$3\,270\,809\,q^2\,\eta^2\,d_h^6\,\delta_h + 900\,440\,k\,\eta^3\,d_h^6\,\delta_h + 2\,701\,320\,q\,\eta^3\,d_h^6\,\delta_h + 779\,856\,\eta^4\,d_h^6\,\delta_h +$$
$$7266\,k^3\,d_h^7\,\delta_h + 97\,992\,k^2\,q\,d_h^7\,\delta_h + 326\,808\,k\,q^2\,d_h^7\,\delta_h + 294\,054\,q^3\,d_h^7\,\delta_h + 119\,790\,k^2\,\eta\,d_h^7\,\delta_h +$$
$$849\,600\,k\,q\,\eta\,d_h^7\,\delta_h + 1\,208\,970\,q^2\,\eta\,d_h^7\,\delta_h + 522\,780\,k\,\eta^2\,d_h^7\,\delta_h + 1\,568\,340\,q\,\eta^2\,d_h^7\,\delta_h +$$
$$638\,880\,\eta^3\,d_h^7\,\delta_h + 18\,414\,k^2\,d_h^8\,\delta_h + 130\,698\,k\,q\,d_h^8\,\delta_h + 185\,940\,q^2\,d_h^8\,\delta_h + 167\,526\,k\,\eta\,d_h^8\,\delta_h +$$
$$502\,578\,q\,\eta\,d_h^8\,\delta_h + 321\,576\,\eta^2\,d_h^8\,\delta_h + 22\,706\,k\,d_h^9\,\delta_h + 68\,118\,q\,d_h^9\,\delta_h + 90\,824\,\eta\,d_h^9\,\delta_h +$$

$$10\,989\,d_h^{10}\,\delta_h + 32\,k^5\,q^4\,\gamma_h\,\delta_h + 303\,k^4\,q^5\,\gamma_h\,\delta_h + 935\,k^3\,q^6\,\gamma_h\,\delta_h + 1243\,k^2\,q^7\,\gamma_h\,\delta_h +$$
$$743\,k\,q^8\,\gamma_h\,\delta_h + 160\,q^9\,\gamma_h\,\delta_h + 144\,k^5\,q^3\,\eta\,\gamma_h\,\delta_h + 1766\,k^4\,q^4\,\eta\,\gamma_h\,\delta_h + 6944\,k^3\,q^5\,\eta\,\gamma_h\,\delta_h +$$
$$11\,480\,k^2\,q^6\,\eta\,\gamma_h\,\delta_h + 8316\,k\,q^7\,\eta\,\gamma_h\,\delta_h + 2142\,q^8\,\eta\,\gamma_h\,\delta_h + 236\,k^5\,q^2\,\eta^2\,\gamma_h\,\delta_h + 4002\,k^4\,q^3\,\eta^2\,\gamma_h\,\delta_h +$$
$$20\,726\,k^3\,q^4\,\eta^2\,\gamma_h\,\delta_h + 43\,582\,k^2\,q^5\,\eta^2\,\gamma_h\,\delta_h + 38\,914\,k\,q^6\,\eta^2\,\gamma_h\,\delta_h + 12\,060\,q^7\,\eta^2\,\gamma_h\,\delta_h +$$
$$160\,k^5\,q\,\eta^3\,\gamma_h\,\delta_h + 4324\,k^4\,q^2\,\eta^3\,\gamma_h\,\delta_h + 31\,508\,k^3\,q^3\,\eta^3\,\gamma_h\,\delta_h + 87\,500\,k^2\,q^4\,\eta^3\,\gamma_h\,\delta_h +$$
$$98\,796\,k\,q^5\,\eta^3\,\gamma_h\,\delta_h + 37\,408\,q^6\,\eta^3\,\gamma_h\,\delta_h + 36\,k^5\,\eta^4\,\gamma_h\,\delta_h + 2166\,k^4\,q\,\eta^4\,\gamma_h\,\delta_h + 25\,302\,k^3\,q^2\,\eta^4\,\gamma_h\,\delta_h +$$
$$99\,142\,k^2\,q^3\,\eta^4\,\gamma_h\,\delta_h + 147\,334\,k\,q^4\,\eta^4\,\gamma_h\,\delta_h + 69\,924\,q^5\,\eta^4\,\gamma_h\,\delta_h + 384\,k^4\,\eta^5\,\gamma_h\,\delta_h +$$
$$9892\,k^3\,q\,\eta^5\,\gamma_h\,\delta_h + 62\,088\,k^2\,q^2\,\eta^5\,\gamma_h\,\delta_h + 129\,860\,k\,q^3\,\eta^5\,\gamma_h\,\delta_h + 80\,432\,q^4\,\eta^5\,\gamma_h\,\delta_h +$$
$$1392\,k^3\,\eta^6\,\gamma_h\,\delta_h + 19\,136\,k^2\,q\,\eta^6\,\gamma_h\,\delta_h + 63\,936\,k\,q^2\,\eta^6\,\gamma_h\,\delta_h + 55\,248\,q^3\,\eta^6\,\gamma_h\,\delta_h + 2048\,k^2\,\eta^7\,\gamma_h\,\delta_h +$$
$$14\,976\,k\,q\,\eta^7\,\gamma_h\,\delta_h + 20\,480\,q^2\,\eta^7\,\gamma_h\,\delta_h + 1024\,k\,\eta^8\,\gamma_h\,\delta_h + 3072\,q\,\eta^8\,\gamma_h\,\delta_h + 176\,k^5\,q^3\,d_h\,\gamma_h\,\delta_h +$$
$$2214\,k^4\,q^4\,d_h\,\gamma_h\,\delta_h + 8704\,k^3\,q^5\,d_h\,\gamma_h\,\delta_h + 14\,332\,k^2\,q^6\,d_h\,\gamma_h\,\delta_h + 10\,420\,k\,q^7\,d_h\,\gamma_h\,\delta_h +$$
$$2718\,q^8\,d_h\,\gamma_h\,\delta_h + 592\,k^5\,q^2\,\eta\,d_h\,\gamma_h\,\delta_h + 10\,292\,k^4\,q^3\,\eta\,d_h\,\gamma_h\,\delta_h + 53\,548\,k^3\,q^4\,\eta\,d_h\,\gamma_h\,\delta_h +$$
$$112\,534\,k^2\,q^5\,\eta\,d_h\,\gamma_h\,\delta_h + 101\,014\,k\,q^6\,\eta\,d_h\,\gamma_h\,\delta_h + 31\,824\,q^7\,\eta\,d_h\,\gamma_h\,\delta_h + 632\,k^5\,q\,\eta^2\,d_h\,\gamma_h\,\delta_h +$$
$$17\,316\,k^4\,q^2\,\eta^2\,d_h\,\gamma_h\,\delta_h + 126\,736\,k^3\,q^3\,\eta^2\,d_h\,\gamma_h\,\delta_h + 352\,466\,k^2\,q^4\,\eta^2\,d_h\,\gamma_h\,\delta_h +$$
$$400\,556\,k\,q^5\,\eta^2\,d_h\,\gamma_h\,\delta_h + 154\,530\,q^6\,\eta^2\,d_h\,\gamma_h\,\delta_h + 204\,k^5\,\eta^3\,d_h\,\gamma_h\,\delta_h + 12\,208\,k^4\,q\,\eta^3\,d_h\,\gamma_h\,\delta_h +$$
$$142\,556\,k^3\,q^2\,\eta^3\,d_h\,\gamma_h\,\delta_h + 559\,288\,k^2\,q^3\,\eta^3\,d_h\,\gamma_h\,\delta_h + 836\,900\,k\,q^4\,\eta^3\,d_h\,\gamma_h\,\delta_h +$$
$$405\,228\,q^5\,\eta^3\,d_h\,\gamma_h\,\delta_h + 2932\,k^4\,\eta^4\,d_h\,\gamma_h\,\delta_h + 74\,652\,k^3\,q\,\eta^4\,d_h\,\gamma_h\,\delta_h + 467\,800\,k^2\,q^2\,\eta^4\,d_h\,\gamma_h\,\delta_h +$$
$$984\,324\,k\,q^3\,\eta^4\,d_h\,\gamma_h\,\delta_h + 622\,436\,q^4\,\eta^4\,d_h\,\gamma_h\,\delta_h + 14\,008\,k^3\,\eta^5\,d_h\,\gamma_h\,\delta_h + 190\,680\,k^2\,q\,\eta^5\,d_h\,\gamma_h\,\delta_h +$$
$$638\,920\,k\,q^2\,\eta^5\,d_h\,\gamma_h\,\delta_h + 563\,688\,q^3\,\eta^5\,d_h\,\gamma_h\,\delta_h + 28\,064\,k^2\,\eta^6\,d_h\,\gamma_h\,\delta_h + 203\,648\,k\,q\,\eta^6\,d_h\,\gamma_h\,\delta_h +$$
$$283\,808\,q^2\,\eta^6\,d_h\,\gamma_h\,\delta_h + 22\,272\,k\,\eta^7\,d_h\,\gamma_h\,\delta_h + 66\,816\,q\,\eta^7\,d_h\,\gamma_h\,\delta_h + 4096\,\eta^8\,d_h\,\gamma_h\,\delta_h +$$
$$352\,k^5\,q^2\,d_h^2\,\gamma_h\,\delta_h + 6338\,k^4\,q^3\,d_h^2\,\gamma_h\,\delta_h + 33\,204\,k^3\,q^4\,d_h^2\,\gamma_h\,\delta_h + 69\,663\,k^2\,q^5\,d_h^2\,\gamma_h\,\delta_h +$$
$$62\,595\,k\,q^6\,d_h^2\,\gamma_h\,\delta_h + 19\,854\,q^7\,d_h^2\,\gamma_h\,\delta_h + 784\,k^5\,q\,\eta\,d_h^2\,\gamma_h\,\delta_h + 21\,992\,k^4\,q^2\,\eta\,d_h^2\,\gamma_h\,\delta_h +$$
$$162\,228\,k^3\,q^3\,\eta\,d_h^2\,\gamma_h\,\delta_h + 451\,584\,k^2\,q^4\,\eta\,d_h^2\,\gamma_h\,\delta_h + 514\,686\,k\,q^5\,\eta\,d_h^2\,\gamma_h\,\delta_h + 200\,628\,q^6\,\eta\,d_h^2\,\gamma_h\,\delta_h +$$
$$408\,k^5\,\eta^2\,d_h^2\,\gamma_h\,\delta_h + 24\,338\,k^4\,q\,\eta^2\,d_h^2\,\gamma_h\,\delta_h + 284\,890\,k^3\,q^2\,\eta^2\,d_h^2\,\gamma_h\,\delta_h + 1\,118\,860\,k^2\,q^3\,\eta^2\,d_h^2\,\gamma_h\,\delta_h +$$
$$1\,680\,576\,k\,q^4\,\eta^2\,d_h^2\,\gamma_h\,\delta_h + 824\,040\,q^5\,\eta^2\,d_h^2\,\gamma_h\,\delta_h + 8352\,k^4\,\eta^3\,d_h^2\,\gamma_h\,\delta_h + 210\,088\,k^3\,q\,\eta^3\,d_h^2\,\gamma_h\,\delta_h +$$
$$1\,313\,156\,k^2\,q^2\,\eta^3\,d_h^2\,\gamma_h\,\delta_h + 2\,771\,700\,k\,q^3\,\eta^3\,d_h^2\,\gamma_h\,\delta_h + 1\,776\,816\,q^4\,\eta^3\,d_h^2\,\gamma_h\,\delta_h +$$
$$53\,488\,k^3\,\eta^4\,d_h^2\,\gamma_h\,\delta_h + 718\,516\,k^2\,q\,\eta^4\,d_h^2\,\gamma_h\,\delta_h + 2\,406\,652\,k\,q^2\,\eta^4\,d_h^2\,\gamma_h\,\delta_h + 2\,152\,304\,q^3\,\eta^4\,d_h^2\,\gamma_h\,\delta_h +$$
$$142\,080\,k^2\,\eta^5\,d_h^2\,\gamma_h\,\delta_h + 1\,019\,520\,k\,q\,\eta^5\,d_h^2\,\gamma_h\,\delta_h + 1\,436\,928\,q^2\,\eta^5\,d_h^2\,\gamma_h\,\delta_h + 156\,672\,k\,\eta^6\,d_h^2\,\gamma_h\,\delta_h +$$
$$470\,016\,q\,\eta^6\,d_h^2\,\gamma_h\,\delta_h + 52\,224\,\eta^7\,d_h^2\,\gamma_h\,\delta_h + 304\,k^5\,q\,d_h^3\,\gamma_h\,\delta_h + 8872\,k^4\,q^2\,d_h^3\,\gamma_h\,\delta_h +$$
$$66\,284\,k^3\,q^3\,d_h^3\,\gamma_h\,\delta_h + 184\,706\,k^2\,q^4\,d_h^3\,\gamma_h\,\delta_h + 210\,508\,k\,q^5\,d_h^3\,\gamma_h\,\delta_h + 82\,310\,q^6\,d_h^3\,\gamma_h\,\delta_h +$$
$$336\,k^5\,\eta\,d_h^3\,\gamma_h\,\delta_h + 20\,396\,k^4\,q\,\eta\,d_h^3\,\gamma_h\,\delta_h + 240\,868\,k^3\,q^2\,\eta\,d_h^3\,\gamma_h\,\delta_h + 947\,980\,k^2\,q^3\,\eta\,d_h^3\,\gamma_h\,\delta_h +$$
$$1\,426\,320\,k\,q^4\,\eta\,d_h^3\,\gamma_h\,\delta_h + 703\,860\,q^5\,\eta\,d_h^3\,\gamma_h\,\delta_h + 11\,108\,k^4\,\eta^2\,d_h^3\,\gamma_h\,\delta_h + 278\,484\,k^3\,q\,\eta^2\,d_h^3\,\gamma_h\,\delta_h +$$
$$1\,739\,828\,k^2\,q^2\,\eta^2\,d_h^3\,\gamma_h\,\delta_h + 3\,678\,844\,k\,q^3\,\eta^2\,d_h^3\,\gamma_h\,\delta_h + 2\,377\,992\,q^4\,\eta^2\,d_h^3\,\gamma_h\,\delta_h +$$
$$100\,672\,k^3\,\eta^3\,d_h^3\,\gamma_h\,\delta_h + 1\,340\,104\,k^2\,q\,\eta^3\,d_h^3\,\gamma_h\,\delta_h + 4\,485\,440\,k\,q^2\,\eta^3\,d_h^3\,\gamma_h\,\delta_h +$$
$$4\,046\,520\,q^3\,\eta^3\,d_h^3\,\gamma_h\,\delta_h + 358\,616\,k^2\,\eta^4\,d_h^3\,\gamma_h\,\delta_h + 2\,551\,472\,k\,q\,\eta^4\,d_h^3\,\gamma_h\,\delta_h +$$
$$3\,621\,368\,q^2\,\eta^4\,d_h^3\,\gamma_h\,\delta_h + 527\,360\,k\,\eta^5\,d_h^3\,\gamma_h\,\delta_h + 1\,582\,080\,q\,\eta^5\,d_h^3\,\gamma_h\,\delta_h + 251\,392\,\eta^6\,d_h^3\,\gamma_h\,\delta_h +$$
$$96\,k^5\,d_h^4\,\gamma_h\,\delta_h + 6071\,k^4\,q\,d_h^4\,\gamma_h\,\delta_h + 72\,915\,k^3\,q^2\,d_h^4\,\gamma_h\,\delta_h + 288\,065\,k^2\,q^3\,d_h^4\,\gamma_h\,\delta_h +$$
$$433\,417\,k\,q^4\,d_h^4\,\gamma_h\,\delta_h + 214\,080\,q^5\,d_h^4\,\gamma_h\,\delta_h + 6930\,k^4\,\eta\,d_h^4\,\gamma_h\,\delta_h + 175\,068\,k^3\,q\,\eta\,d_h^4\,\gamma_h\,\delta_h +$$
$$1\,096\,600\,k^2\,q^2\,\eta\,d_h^4\,\gamma_h\,\delta_h + 2\,321\,336\,k\,q^3\,\eta\,d_h^4\,\gamma_h\,\delta_h + 1\,506\,270\,q^4\,\eta\,d_h^4\,\gamma_h\,\delta_h + 99\,808\,k^3\,\eta^2\,d_h^4\,\gamma_h\,\delta_h +$$
$$1\,323\,922\,k^2\,q\,\eta^2\,d_h^4\,\gamma_h\,\delta_h + 4\,430\,566\,k\,q^2\,\eta^2\,d_h^4\,\gamma_h\,\delta_h + 4\,017\,488\,q^3\,\eta^2\,d_h^4\,\gamma_h\,\delta_h +$$
$$501\,136\,k^2\,\eta^3\,d_h^4\,\gamma_h\,\delta_h + 3\,546\,336\,k\,q\,\eta^3\,d_h^4\,\gamma_h\,\delta_h + 5\,055\,376\,q^2\,\eta^3\,d_h^4\,\gamma_h\,\delta_h + 989\,568\,k\,\eta^4\,d_h^4\,\gamma_h\,\delta_h +$$
$$2\,968\,704\,q\,\eta^4\,d_h^4\,\gamma_h\,\delta_h + 635\,648\,\eta^5\,d_h^4\,\gamma_h\,\delta_h + 1626\,k^4\,d_h^5\,\gamma_h\,\delta_h + 41\,884\,k^3\,q\,d_h^5\,\gamma_h\,\delta_h +$$
$$263\,984\,k^2\,q^2\,d_h^5\,\gamma_h\,\delta_h + 559\,188\,k\,q^3\,d_h^5\,\gamma_h\,\delta_h + 362\,796\,q^4\,d_h^5\,\gamma_h\,\delta_h + 49\,824\,k^3\,\eta\,d_h^5\,\gamma_h\,\delta_h +$$

$$662\,350\,k^2\,q\,\eta\,d_h^5\,\gamma_h\,\delta_h + 2\,218\,118\,k\,q^2\,\eta\,d_h^5\,\gamma_h\,\delta_h + 2\,015\,664\,q^3\,\eta\,d_h^5\,\gamma_h\,\delta_h + 394\,274\,k^2\,\eta^2\,d_h^5\,\gamma_h\,\delta_h +$$
$$2\,783\,144\,k\,q\,\eta^2\,d_h^5\,\gamma_h\,\delta_h + 3\,977\,258\,q^2\,\eta^2\,d_h^5\,\gamma_h\,\delta_h + 1\,095\,984\,k\,\eta^3\,d_h^5\,\gamma_h\,\delta_h + 3\,287\,952\,q\,\eta^3\,d_h^5\,\gamma_h\,\delta_h +$$
$$949\,536\,\eta^4\,d_h^5\,\gamma_h\,\delta_h + 9818\,k^3\,d_h^6\,\gamma_h\,\delta_h + 131\,573\,k^2\,q\,d_h^6\,\gamma_h\,\delta_h + 441\,329\,k\,q^2\,d_h^6\,\gamma_h\,\delta_h +$$
$$400\,862\,q^3\,d_h^6\,\gamma_h\,\delta_h + 163\,200\,k^2\,\eta\,d_h^6\,\gamma_h\,\delta_h + 1\,152\,142\,k\,q\,\eta\,d_h^6\,\gamma_h\,\delta_h + 1\,648\,080\,q^2\,\eta\,d_h^6\,\gamma_h\,\delta_h +$$
$$712\,560\,k\,\eta^2\,d_h^6\,\gamma_h\,\delta_h + 2\,137\,680\,q\,\eta^2\,d_h^6\,\gamma_h\,\delta_h + 870\,400\,\eta^3\,d_h^6\,\gamma_h\,\delta_h + 27\,522\,k^2\,d_h^7\,\gamma_h\,\delta_h +$$
$$194\,796\,k\,q\,d_h^7\,\gamma_h\,\delta_h + 278\,550\,q^2\,d_h^7\,\gamma_h\,\delta_h + 251\,028\,k\,\eta\,d_h^7\,\gamma_h\,\delta_h + 753\,084\,q\,\eta\,d_h^7\,\gamma_h\,\delta_h +$$
$$481\,488\,\eta^2\,d_h^7\,\gamma_h\,\delta_h + 36\,828\,k\,d_h^8\,\gamma_h\,\delta_h + 110\,484\,q\,d_h^8\,\gamma_h\,\delta_h + 147\,312\,\eta\,d_h^8\,\gamma_h\,\delta_h +$$
$$19\,066\,d_h^9\,\gamma_h\,\delta_h + 10\,k^5\,q^3\,\gamma_h^2\,\delta_h + 164\,k^4\,q^4\,\gamma_h^2\,\delta_h + 742\,k^3\,q^5\,\gamma_h^2\,\delta_h + 1341\,k^2\,q^6\,\gamma_h^2\,\delta_h +$$
$$1042\,k\,q^7\,\gamma_h^2\,\delta_h + 288\,q^8\,\gamma_h^2\,\delta_h + 42\,k^5\,q^2\,\eta\,\gamma_h^2\,\delta_h + 838\,k^4\,q^3\,\eta\,\gamma_h^2\,\delta_h + 4762\,k^3\,q^4\,\eta\,\gamma_h^2\,\delta_h +$$
$$10\,718\,k^2\,q^5\,\eta\,\gamma_h^2\,\delta_h + 10\,166\,k\,q^6\,\eta\,\gamma_h^2\,\delta_h + 3366\,q^7\,\eta\,\gamma_h^2\,\delta_h + 54\,k^5\,q\,\eta^2\,\gamma_h^2\,\delta_h + 1556\,k^4\,q^2\,\eta^2\,\gamma_h^2\,\delta_h +$$
$$11\,862\,k^3\,q^3\,\eta^2\,\gamma_h^2\,\delta_h + 34\,387\,k^2\,q^4\,\eta^2\,\gamma_h^2\,\delta_h + 40\,664\,k\,q^5\,\eta^2\,\gamma_h^2\,\delta_h + 16\,293\,q^6\,\eta^2\,\gamma_h^2\,\delta_h +$$
$$18\,k^5\,\eta^3\,\gamma_h^2\,\delta_h + 1178\,k^4\,q\,\eta^3\,\gamma_h^2\,\delta_h + 14\,006\,k^3\,q^2\,\eta^3\,\gamma_h^2\,\delta_h + 56\,074\,k^2\,q^3\,\eta^3\,\gamma_h^2\,\delta_h +$$
$$85\,938\,k\,q^4\,\eta^3\,\gamma_h^2\,\delta_h + 42\,618\,q^5\,\eta^3\,\gamma_h^2\,\delta_h + 282\,k^4\,\eta^4\,\gamma_h^2\,\delta_h + 7556\,k^3\,q\,\eta^4\,\gamma_h^2\,\delta_h +$$
$$48\,048\,k^2\,q^2\,\eta^4\,\gamma_h^2\,\delta_h + 102\,300\,k\,q^3\,\eta^4\,\gamma_h^2\,\delta_h + 65\,274\,q^4\,\eta^4\,\gamma_h^2\,\delta_h + 1380\,k^3\,\eta^5\,\gamma_h^2\,\delta_h +$$
$$19\,716\,k^2\,q\,\eta^5\,\gamma_h^2\,\delta_h + 66\,764\,k\,q^2\,\eta^5\,\gamma_h^2\,\delta_h + 58\,572\,q^3\,\eta^5\,\gamma_h^2\,\delta_h + 2736\,k^2\,\eta^6\,\gamma_h^2\,\delta_h +$$
$$20\,768\,k\,q\,\eta^6\,\gamma_h^2\,\delta_h + 28\,464\,q^2\,\eta^6\,\gamma_h^2\,\delta_h + 1920\,k\,\eta^7\,\gamma_h^2\,\delta_h + 5760\,q\,\eta^7\,\gamma_h^2\,\delta_h + 42\,k^5\,q^2\,d_h\,\gamma_h^2\,\delta_h +$$
$$942\,k^4\,q^3\,d_h\,\gamma_h^2\,\delta_h + 5538\,k^3\,q^4\,d_h\,\gamma_h^2\,\delta_h + 12\,532\,k^2\,q^5\,d_h\,\gamma_h^2\,\delta_h + 11\,888\,k\,q^6\,d_h\,\gamma_h^2\,\delta_h +$$
$$3942\,q^7\,d_h\,\gamma_h^2\,\delta_h + 112\,k^5\,q\,\eta\,d_h\,\gamma_h^2\,\delta_h + 3564\,k^4\,q^2\,\eta\,d_h\,\gamma_h^2\,\delta_h + 28\,204\,k^3\,q^3\,\eta\,d_h\,\gamma_h^2\,\delta_h +$$
$$82\,786\,k^2\,q^4\,\eta\,d_h\,\gamma_h^2\,\delta_h + 98\,520\,k\,q^5\,\eta\,d_h\,\gamma_h^2\,\delta_h + 39\,882\,q^6\,\eta\,d_h\,\gamma_h^2\,\delta_h + 66\,k^5\,\eta^2\,d_h\,\gamma_h^2\,\delta_h +$$
$$4274\,k^4\,q\,\eta^2\,d_h\,\gamma_h^2\,\delta_h + 51\,846\,k^3\,q^2\,\eta^2\,d_h\,\gamma_h^2\,\delta_h + 209\,926\,k^2\,q^3\,\eta^2\,d_h\,\gamma_h^2\,\delta_h + 324\,698\,k\,q^4\,\eta^2\,d_h\,\gamma_h^2\,\delta_h +$$
$$163\,662\,q^5\,\eta^2\,d_h\,\gamma_h^2\,\delta_h + 1524\,k^4\,\eta^3\,d_h\,\gamma_h^2\,\delta_h + 39\,648\,k^3\,q\,\eta^3\,d_h\,\gamma_h^2\,\delta_h + 252\,060\,k^2\,q^2\,\eta^3\,d_h\,\gamma_h^2\,\delta_h +$$
$$540\,824\,k\,q^3\,\eta^3\,d_h\,\gamma_h^2\,\delta_h + 352\,152\,q^4\,\eta^3\,d_h\,\gamma_h^2\,\delta_h + 10\,140\,k^3\,\eta^4\,d_h\,\gamma_h^2\,\delta_h + 139\,764\,k^2\,q\,\eta^4\,d_h\,\gamma_h^2\,\delta_h +$$
$$472\,724\,k\,q^2\,\eta^4\,d_h\,\gamma_h^2\,\delta_h + 424\,284\,q^3\,\eta^4\,d_h\,\gamma_h^2\,\delta_h + 27\,120\,k^2\,\eta^5\,d_h\,\gamma_h^2\,\delta_h + 198\,752\,k\,q\,\eta^5\,d_h\,\gamma_h^2\,\delta_h +$$
$$278\,640\,q^2\,\eta^5\,d_h\,\gamma_h^2\,\delta_h + 28\,800\,k\,\eta^6\,d_h\,\gamma_h^2\,\delta_h + 86\,400\,q\,\eta^6\,d_h\,\gamma_h^2\,\delta_h + 7680\,\eta^7\,d_h\,\gamma_h^2\,\delta_h +$$
$$56\,k^5\,q\,d_h^2\,\gamma_h^2\,\delta_h + 1978\,k^4\,q^2\,d_h^2\,\gamma_h^2\,\delta_h + 16\,236\,k^3\,q^3\,d_h^2\,\gamma_h^2\,\delta_h + 48\,039\,k^2\,q^4\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$57\,186\,k\,q^5\,d_h^2\,\gamma_h^2\,\delta_h + 23\,151\,q^6\,d_h^2\,\gamma_h^2\,\delta_h + 72\,k^5\,\eta\,d_h^2\,\gamma_h^2\,\delta_h + 4920\,k^4\,q\,\eta\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$61\,440\,k^3\,q^2\,\eta\,d_h^2\,\gamma_h^2\,\delta_h + 251\,472\,k^2\,q^3\,\eta\,d_h^2\,\gamma_h^2\,\delta_h + 390\,930\,k\,q^4\,\eta\,d_h^2\,\gamma_h^2\,\delta_h + 198\,558\,q^5\,\eta\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$2850\,k^4\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h + 73\,892\,k^3\,q\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h + 471\,590\,k^2\,q^2\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h + 1\,017\,524\,k\,q^3\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$670\,824\,q^4\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h + 27\,312\,k^3\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h + 369\,488\,k^2\,q\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h + 1\,249\,804\,k\,q^2\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$1\,138\,260\,q^3\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h + 98\,868\,k^2\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h + 710\,968\,k\,q\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h + 1\,009\,956\,q^2\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h +$$
$$143\,616\,k\,\eta^5\,d_h^2\,\gamma_h^2\,\delta_h + 430\,848\,q\,\eta^5\,d_h^2\,\gamma_h^2\,\delta_h + 63\,744\,\eta^6\,d_h^2\,\gamma_h^2\,\delta_h + 24\,k^5\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$1800\,k^4\,q\,d_h^3\,\gamma_h^2\,\delta_h + 23\,340\,k^3\,q^2\,d_h^3\,\gamma_h^2\,\delta_h + 96\,516\,k^2\,q^3\,d_h^3\,\gamma_h^2\,\delta_h + 150\,190\,k\,q^4\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$76\,230\,q^5\,d_h^3\,\gamma_h^2\,\delta_h + 2208\,k^4\,\eta\,d_h^3\,\gamma_h^2\,\delta_h + 58\,280\,k^3\,q\,\eta\,d_h^3\,\gamma_h^2\,\delta_h + 374\,928\,k^2\,q^2\,\eta\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$812\,008\,k\,q^3\,\eta\,d_h^3\,\gamma_h^2\,\delta_h + 538\,308\,q^4\,\eta\,d_h^3\,\gamma_h^2\,\delta_h + 34\,320\,k^3\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h + 461\,428\,k^2\,q\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$1\,562\,600\,k\,q^2\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h + 1\,435\,476\,q^3\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h + 176\,436\,k^2\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$1\,255\,864\,k\,q\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h + 1\,798\,356\,q^2\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h + 347\,760\,k\,\eta^4\,d_h^3\,\gamma_h^2\,\delta_h + 1\,043\,280\,q\,\eta^4\,d_h^3\,\gamma_h^2\,\delta_h +$$
$$216\,576\,\eta^5\,d_h^3\,\gamma_h^2\,\delta_h + 600\,k^4\,d_h^4\,\gamma_h^2\,\delta_h + 16\,442\,k^3\,q\,d_h^4\,\gamma_h^2\,\delta_h + 107\,049\,k^2\,q^2\,d_h^4\,\gamma_h^2\,\delta_h +$$
$$232\,294\,k\,q^3\,d_h^4\,\gamma_h^2\,\delta_h + 153\,855\,q^4\,d_h^4\,\gamma_h^2\,\delta_h + 20\,310\,k^3\,\eta\,d_h^4\,\gamma_h^2\,\delta_h + 274\,114\,k^2\,q\,\eta\,d_h^4\,\gamma_h^2\,\delta_h +$$
$$930\,218\,k\,q^2\,\eta\,d_h^4\,\gamma_h^2\,\delta_h + 857\,730\,q^3\,\eta\,d_h^4\,\gamma_h^2\,\delta_h + 165\,837\,k^2\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h + 1\,175\,142\,k\,q\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h +$$
$$1\,690\,497\,q^2\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h + 462\,840\,k\,\eta^3\,d_h^4\,\gamma_h^2\,\delta_h + 1\,388\,520\,q\,\eta^3\,d_h^4\,\gamma_h^2\,\delta_h + 394\,704\,\eta^4\,d_h^4\,\gamma_h^2\,\delta_h +$$
$$4542\,k^3\,d_h^5\,\gamma_h^2\,\delta_h + 62\,108\,k^2\,q\,d_h^5\,\gamma_h^2\,\delta_h + 211\,372\,k\,q^2\,d_h^5\,\gamma_h^2\,\delta_h + 194\,754\,q^3\,d_h^5\,\gamma_h^2\,\delta_h +$$
$$78\,606\,k^2\,\eta\,d_h^5\,\gamma_h^2\,\delta_h + 556\,944\,k\,q\,\eta\,d_h^5\,\gamma_h^2\,\delta_h + 802\,746\,q^2\,\eta\,d_h^5\,\gamma_h^2\,\delta_h + 346\,188\,k\,\eta^2\,d_h^5\,\gamma_h^2\,\delta_h +$$
$$1\,038\,564\,q\,\eta^2\,d_h^5\,\gamma_h^2\,\delta_h + 419\,232\,\eta^3\,d_h^5\,\gamma_h^2\,\delta_h + 14\,727\,k^2\,d_h^6\,\gamma_h^2\,\delta_h + 104\,726\,k\,q\,d_h^6\,\gamma_h^2\,\delta_h +$$

$$150\,885\,q^2\,d_h^6\,\gamma_h^2\,\delta_h + 136\,158\,k\,\eta\,d_h^6\,\gamma_h^2\,\delta_h + 408\,474\,q\,\eta\,d_h^6\,\gamma_h^2\,\delta_h + 260\,088\,\eta^2\,d_h^6\,\gamma_h^2\,\delta_h +$$
$$21\,798\,k\,d_h^7\,\gamma_h^2\,\delta_h + 65\,394\,q\,d_h^7\,\gamma_h^2\,\delta_h + 87\,192\,\eta\,d_h^7\,\gamma_h^2\,\delta_h + 12\,141\,d_h^8\,\gamma_h^2\,\delta_h + 24\,k^4\,q^3\,\gamma_h^3\,\delta_h +$$
$$202\,k^3\,q^4\,\gamma_h^3\,\delta_h + 527\,k^2\,q^5\,\gamma_h^3\,\delta_h + 543\,k\,q^6\,\gamma_h^3\,\delta_h + 192\,q^7\,\gamma_h^3\,\delta_h + 104\,k^4\,q^2\,\eta\,\gamma_h^3\,\delta_h +$$
$$1106\,k^3\,q^3\,\eta\,\gamma_h^3\,\delta_h + 3644\,k^2\,q^4\,\eta\,\gamma_h^3\,\delta_h + 4638\,k\,q^5\,\eta\,\gamma_h^3\,\delta_h + 1980\,q^6\,\eta\,\gamma_h^3\,\delta_h + 140\,k^4\,q\,\eta^2\,\gamma_h^3\,\delta_h +$$
$$2184\,k^3\,q^2\,\eta^2\,\gamma_h^3\,\delta_h + 9658\,k^2\,q^3\,\eta^2\,\gamma_h^3\,\delta_h + 15\,658\,k\,q^4\,\eta^2\,\gamma_h^3\,\delta_h + 8176\,q^5\,\eta^2\,\gamma_h^3\,\delta_h + 48\,k^4\,\eta^3\,\gamma_h^3\,\delta_h +$$
$$1728\,k^3\,q\,\eta^3\,\gamma_h^3\,\delta_h + 11\,932\,k^2\,q^2\,\eta^3\,\gamma_h^3\,\delta_h + 26\,404\,k\,q^3\,\eta^3\,\gamma_h^3\,\delta_h + 17\,448\,q^4\,\eta^3\,\gamma_h^3\,\delta_h +$$
$$416\,k^3\,\eta^4\,\gamma_h^3\,\delta_h + 6572\,k^2\,q\,\eta^4\,\gamma_h^3\,\delta_h + 22\,868\,k\,q^2\,\eta^4\,\gamma_h^3\,\delta_h + 20\,400\,q^3\,\eta^4\,\gamma_h^3\,\delta_h + 1152\,k^2\,\eta^5\,\gamma_h^3\,\delta_h +$$
$$9056\,k\,q\,\eta^5\,\gamma_h^3\,\delta_h + 12\,416\,q^2\,\eta^5\,\gamma_h^3\,\delta_h + 1024\,k\,\eta^6\,\gamma_h^3\,\delta_h + 3072\,q\,\eta^6\,\gamma_h^3\,\delta_h + 104\,k^4\,q^2\,d_h\,\gamma_h^3\,\delta_h +$$
$$1182\,k^3\,q^3\,d_h\,\gamma_h^3\,\delta_h + 3944\,k^2\,q^4\,d_h\,\gamma_h^3\,\delta_h + 5022\,k\,q^5\,d_h\,\gamma_h^3\,\delta_h + 2140\,q^6\,d_h\,\gamma_h^3\,\delta_h +$$
$$288\,k^4\,q\,\eta\,d_h\,\gamma_h^3\,\delta_h + 4764\,k^3\,q^2\,\eta\,d_h\,\gamma_h^3\,\delta_h + 21\,504\,k^2\,q^3\,\eta\,d_h\,\gamma_h^3\,\delta_h + 35\,244\,k\,q^4\,\eta\,d_h\,\gamma_h^3\,\delta_h +$$
$$18\,648\,q^5\,\eta\,d_h\,\gamma_h^3\,\delta_h + 176\,k^4\,\eta^2\,d_h\,\gamma_h^3\,\delta_h + 6032\,k^3\,q\,\eta^2\,d_h\,\gamma_h^3\,\delta_h + 41\,772\,k^2\,q^2\,\eta^2\,d_h\,\gamma_h^3\,\delta_h +$$
$$93\,492\,k\,q^3\,\eta^2\,d_h\,\gamma_h^3\,\delta_h + 63\,216\,q^4\,\eta^2\,d_h\,\gamma_h^3\,\delta_h + 2232\,k^3\,\eta^3\,d_h\,\gamma_h^3\,\delta_h + 33\,220\,k^2\,q\,\eta^3\,d_h\,\gamma_h^3\,\delta_h +$$
$$115\,468\,k\,q^2\,\eta^3\,d_h\,\gamma_h^3\,\delta_h + 106\,072\,q^3\,\eta^3\,d_h\,\gamma_h^3\,\delta_h + 8608\,k^2\,\eta^4\,d_h\,\gamma_h^3\,\delta_h + 64\,336\,k\,q\,\eta^4\,d_h\,\gamma_h^3\,\delta_h +$$
$$90\,976\,q^2\,\eta^4\,d_h\,\gamma_h^3\,\delta_h + 11\,904\,k\,\eta^5\,d_h\,\gamma_h^3\,\delta_h + 35\,712\,q\,\eta^5\,d_h\,\gamma_h^3\,\delta_h + 4096\,\eta^6\,d_h\,\gamma_h^3\,\delta_h +$$
$$144\,k^4\,q\,d_h^2\,\gamma_h^3\,\delta_h + 2532\,k^3\,q^2\,d_h^2\,\gamma_h^3\,\delta_h + 11\,586\,k^2\,q^3\,d_h^2\,\gamma_h^3\,\delta_h + 19\,014\,k\,q^4\,d_h^2\,\gamma_h^3\,\delta_h +$$
$$10\,044\,q^5\,d_h^2\,\gamma_h^3\,\delta_h + 192\,k^4\,\eta\,d_h^2\,\gamma_h^3\,\delta_h + 6672\,k^3\,q\,\eta\,d_h^2\,\gamma_h^3\,\delta_h + 46\,656\,k^2\,q^2\,\eta\,d_h^2\,\gamma_h^3\,\delta_h +$$
$$105\,144\,k\,q^3\,\eta\,d_h^2\,\gamma_h^3\,\delta_h + 71\,832\,q^4\,\eta\,d_h^2\,\gamma_h^3\,\delta_h + 4056\,k^3\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h + 58\,954\,k^2\,q\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h +$$
$$205\,174\,k\,q^2\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h + 191\,616\,q^3\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h + 22\,552\,k^2\,\eta^3\,d_h^2\,\gamma_h^3\,\delta_h + 164\,608\,k\,q\,\eta^3\,d_h^2\,\gamma_h^3\,\delta_h +$$
$$236\,632\,q^2\,\eta^3\,d_h^2\,\gamma_h^3\,\delta_h + 44\,064\,k\,\eta^4\,d_h^2\,\gamma_h^3\,\delta_h + 132\,192\,q\,\eta^4\,d_h^2\,\gamma_h^3\,\delta_h + 25\,088\,\eta^5\,d_h^2\,\gamma_h^3\,\delta_h +$$
$$64\,k^4\,d_h^3\,\gamma_h^3\,\delta_h + 2352\,k^3\,q\,d_h^3\,\gamma_h^3\,\delta_h + 16\,680\,k^2\,q^2\,d_h^3\,\gamma_h^3\,\delta_h + 37\,672\,k\,q^3\,d_h^3\,\gamma_h^3\,\delta_h +$$
$$25\,704\,q^4\,d_h^3\,\gamma_h^3\,\delta_h + 3040\,k^3\,\eta\,d_h^3\,\gamma_h^3\,\delta_h + 44\,076\,k^2\,q\,\eta\,d_h^3\,\gamma_h^3\,\delta_h + 153\,756\,k\,q^2\,\eta\,d_h^3\,\gamma_h^3\,\delta_h +$$
$$144\,640\,q^3\,\eta\,d_h^3\,\gamma_h^3\,\delta_h + 27\,144\,k^2\,\eta^2\,d_h^3\,\gamma_h^3\,\delta_h + 195\,992\,k\,q\,\eta^2\,d_h^3\,\gamma_h^3\,\delta_h + 284\,264\,q^2\,\eta^2\,d_h^3\,\gamma_h^3\,\delta_h +$$
$$76\,480\,k\,\eta^3\,d_h^3\,\gamma_h^3\,\delta_h + 229\,440\,q\,\eta^3\,d_h^3\,\gamma_h^3\,\delta_h + 62\,592\,\eta^4\,d_h^3\,\gamma_h^3\,\delta_h + 800\,k^3\,d_h^4\,\gamma_h^3\,\delta_h +$$
$$11\,763\,k^2\,q\,d_h^4\,\gamma_h^3\,\delta_h + 41\,151\,k\,q^2\,d_h^4\,\gamma_h^3\,\delta_h + 38\,680\,q^3\,d_h^4\,\gamma_h^3\,\delta_h + 15\,300\,k^2\,\eta\,d_h^4\,\gamma_h^3\,\delta_h +$$
$$110\,154\,k\,q\,\eta\,d_h^4\,\gamma_h^3\,\delta_h + 160\,380\,q^2\,\eta\,d_h^4\,\gamma_h^3\,\delta_h + 68\,760\,k\,\eta^2\,d_h^4\,\gamma_h^3\,\delta_h + 206\,280\,q\,\eta^2\,d_h^4\,\gamma_h^3\,\delta_h +$$
$$81\,600\,\eta^3\,d_h^4\,\gamma_h^3\,\delta_h + 3252\,k^2\,d_h^5\,\gamma_h^3\,\delta_h + 23\,490\,k\,q\,d_h^5\,\gamma_h^3\,\delta_h + 34\,188\,q^2\,d_h^5\,\gamma_h^3\,\delta_h +$$
$$30\,936\,k\,\eta\,d_h^5\,\gamma_h^3\,\delta_h + 92\,808\,q\,\eta\,d_h^5\,\gamma_h^3\,\delta_h + 58\,592\,\eta^2\,d_h^5\,\gamma_h^3\,\delta_h + 5476\,k\,d_h^6\,\gamma_h^3\,\delta_h + 16\,428\,q\,d_h^6\,\gamma_h^3\,\delta_h +$$
$$21\,904\,\eta\,d_h^6\,\gamma_h^3\,\delta_h + 3312\,d_h^7\,\gamma_h^3\,\delta_h + 14\,k^3\,q^3\,\gamma_h^4\,\delta_h + 62\,k^2\,q^4\,\gamma_h^4\,\delta_h + 88\,k\,q^5\,\gamma_h^4\,\delta_h + 40\,q^6\,\gamma_h^4\,\delta_h +$$
$$62\,k^3\,q^2\,\eta\,\gamma_h^4\,\delta_h + 362\,k^2\,q^3\,\eta\,\gamma_h^4\,\delta_h + 648\,k\,q^4\,\eta\,\gamma_h^4\,\delta_h + 360\,q^5\,\eta\,\gamma_h^4\,\delta_h + 86\,k^3\,q\,\eta^2\,\gamma_h^4\,\delta_h +$$
$$750\,k^2\,q^2\,\eta^2\,\gamma_h^4\,\delta_h + 1786\,k\,q^3\,\eta^2\,\gamma_h^4\,\delta_h + 1230\,q^4\,\eta^2\,\gamma_h^4\,\delta_h + 30\,k^3\,\eta^3\,\gamma_h^4\,\delta_h + 606\,k^2\,q\,\eta^3\,\gamma_h^4\,\delta_h +$$
$$2218\,k\,q^2\,\eta^3\,\gamma_h^4\,\delta_h + 2010\,q^3\,\eta^3\,\gamma_h^4\,\delta_h + 140\,k^2\,\eta^4\,\gamma_h^4\,\delta_h + 1160\,k\,q\,\eta^4\,\gamma_h^4\,\delta_h + 1580\,q^2\,\eta^4\,\gamma_h^4\,\delta_h +$$
$$160\,k\,\eta^5\,\gamma_h^4\,\delta_h + 480\,q\,\eta^5\,\gamma_h^4\,\delta_h + 62\,k^3\,q^2\,d_h\,\gamma_h^4\,\delta_h + 362\,k^2\,q^3\,d_h\,\gamma_h^4\,\delta_h + 648\,k\,q^4\,d_h\,\gamma_h^4\,\delta_h +$$
$$360\,q^5\,d_h\,\gamma_h^4\,\delta_h + 176\,k^3\,q\,\eta\,d_h\,\gamma_h^4\,\delta_h + 1544\,k^2\,q^2\,\eta\,d_h\,\gamma_h^4\,\delta_h + 3728\,k\,q^3\,\eta\,d_h\,\gamma_h^4\,\delta_h +$$
$$2640\,q^4\,\eta\,d_h\,\gamma_h^4\,\delta_h + 110\,k^3\,\eta^2\,d_h\,\gamma_h^4\,\delta_h + 2030\,k^2\,q\,\eta^2\,d_h\,\gamma_h^4\,\delta_h + 7450\,k\,q^2\,\eta^2\,d_h\,\gamma_h^4\,\delta_h +$$
$$7050\,q^3\,\eta^2\,d_h\,\gamma_h^4\,\delta_h + 760\,k^2\,\eta^3\,d_h\,\gamma_h^4\,\delta_h + 5904\,k\,q\,\eta^3\,d_h\,\gamma_h^4\,\delta_h + 8440\,q^2\,\eta^3\,d_h\,\gamma_h^4\,\delta_h +$$
$$1440\,k\,\eta^4\,d_h\,\gamma_h^4\,\delta_h + 4320\,q\,\eta^4\,d_h\,\gamma_h^4\,\delta_h + 640\,\eta^5\,d_h\,\gamma_h^4\,\delta_h + 88\,k^3\,q\,d_h^2\,\gamma_h^4\,\delta_h + 772\,k^2\,q^2\,d_h^2\,\gamma_h^4\,\delta_h +$$
$$1864\,k\,q^3\,d_h^2\,\gamma_h^4\,\delta_h + 1320\,q^4\,d_h^2\,\gamma_h^4\,\delta_h + 120\,k^3\,\eta\,d_h^2\,\gamma_h^4\,\delta_h + 2136\,k^2\,q\,\eta\,d_h^2\,\gamma_h^4\,\delta_h +$$
$$7848\,k\,q^2\,\eta\,d_h^2\,\gamma_h^4\,\delta_h + 7560\,q^3\,\eta\,d_h^2\,\gamma_h^4\,\delta_h + 1340\,k^2\,\eta^2\,d_h^2\,\gamma_h^4\,\delta_h + 10\,120\,k\,q\,\eta^2\,d_h^2\,\gamma_h^4\,\delta_h +$$
$$14\,780\,q^2\,\eta^2\,d_h^2\,\gamma_h^4\,\delta_h + 3840\,k\,\eta^3\,d_h^2\,\gamma_h^4\,\delta_h + 11\,520\,q\,\eta^3\,d_h^2\,\gamma_h^4\,\delta_h + 2880\,\eta^4\,d_h^2\,\gamma_h^4\,\delta_h +$$
$$40\,k^3\,d_h^3\,\gamma_h^4\,\delta_h + 712\,k^2\,q\,d_h^3\,\gamma_h^4\,\delta_h + 2616\,k\,q^2\,d_h^3\,\gamma_h^4\,\delta_h + 2520\,q^3\,d_h^3\,\gamma_h^4\,\delta_h + 960\,k^2\,\eta\,d_h^3\,\gamma_h^4\,\delta_h +$$
$$7168\,k\,q\,\eta\,d_h^3\,\gamma_h^4\,\delta_h + 10\,560\,q^2\,\eta\,d_h^3\,\gamma_h^4\,\delta_h + 4480\,k\,\eta^2\,d_h^3\,\gamma_h^4\,\delta_h + 13\,440\,q\,\eta^2\,d_h^3\,\gamma_h^4\,\delta_h +$$
$$5120\,\eta^3\,d_h^3\,\gamma_h^4\,\delta_h + 240\,k^2\,d_h^4\,\gamma_h^4\,\delta_h + 1792\,k\,q\,d_h^4\,\gamma_h^4\,\delta_h + 2640\,q^2\,d_h^4\,\gamma_h^4\,\delta_h + 2400\,k\,\eta\,d_h^4\,\gamma_h^4\,\delta_h +$$
$$7200\,q\,\eta\,d_h^4\,\gamma_h^4\,\delta_h + 4480\,\eta^2\,d_h^4\,\gamma_h^4\,\delta_h + 480\,k\,d_h^5\,\gamma_h^4\,\delta_h + 1440\,q\,d_h^5\,\gamma_h^4\,\delta_h + 1920\,\eta\,d_h^5\,\gamma_h^4\,\delta_h +$$

$$320\,d_h^6\,\gamma_h^4\,\delta_h + 24\,k^5\,q^4\,\delta_h^2 + 189\,k^4\,q^5\,\delta_h^2 + 491\,k^3\,q^6\,\delta_h^2 + 585\,k^2\,q^7\,\delta_h^2 + 351\,k\,q^8\,\delta_h^2 +$$
$$80\,q^9\,\delta_h^2 + 96\,k^5\,q^3\,\eta\,\delta_h^2 + 1065\,k^4\,q^4\,\eta\,\delta_h^2 + 3702\,k^3\,q^5\,\eta\,\delta_h^2 + 5568\,k^2\,q^6\,\eta\,\delta_h^2 + 3978\,k\,q^7\,\eta\,\delta_h^2 +$$
$$1071\,q^8\,\eta\,\delta_h^2 + 138\,k^5\,q^2\,\eta^2\,\delta_h^2 + 2278\,k^4\,q^3\,\eta^2\,\delta_h^2 + 10\,956\,k^3\,q^4\,\eta^2\,\delta_h^2 + 21\,420\,k^2\,q^5\,\eta^2\,\delta_h^2 +$$
$$18\,762\,k\,q^6\,\eta^2\,\delta_h^2 + 6030\,q^7\,\eta^2\,\delta_h^2 + 84\,k^5\,q\,\eta^3\,\delta_h^2 + 2304\,k^4\,q^2\,\eta^3\,\delta_h^2 + 16\,256\,k^3\,q^3\,\eta^3\,\delta_h^2 +$$
$$43\,008\,k^2\,q^4\,\eta^3\,\delta_h^2 + 47\,772\,k\,q^5\,\eta^3\,\delta_h^2 + 18\,704\,q^6\,\eta^3\,\delta_h^2 + 18\,k^5\,\eta^4\,\delta_h^2 + 1094\,k^4\,q\,\eta^4\,\delta_h^2 +$$
$$12\,672\,k^3\,q^2\,\eta^4\,\delta_h^2 + 48\,312\,k^2\,q^3\,\eta^4\,\delta_h^2 + 71\,134\,k\,q^4\,\eta^4\,\delta_h^2 + 34\,962\,q^5\,\eta^4\,\delta_h^2 + 192\,k^4\,\eta^5\,\delta_h^2 +$$
$$4856\,k^3\,q\,\eta^5\,\delta_h^2 + 29\,928\,k^2\,q^2\,\eta^5\,\delta_h^2 + 62\,408\,k\,q^3\,\eta^5\,\delta_h^2 + 40\,216\,q^4\,\eta^5\,\delta_h^2 + 696\,k^3\,\eta^6\,\delta_h^2 +$$
$$9208\,k^2\,q\,\eta^6\,\delta_h^2 + 30\,568\,k\,q^2\,\eta^6\,\delta_h^2 + 27\,624\,q^3\,\eta^6\,\delta_h^2 + 1024\,k^2\,\eta^7\,\delta_h^2 + 7168\,k\,q\,\eta^7\,\delta_h^2 +$$
$$10\,240\,q^2\,\eta^7\,\delta_h^2 + 512\,k\,\eta^8\,\delta_h^2 + 1536\,q\,\eta^8\,\delta_h^2 + 120\,k^5\,q^3\,d_h\,\delta_h^2 + 1353\,k^4\,q^4\,d_h\,\delta_h^2 + 4692\,k^3\,q^5\,d_h\,\delta_h^2 +$$
$$7041\,k^2\,q^6\,d_h\,\delta_h^2 + 5040\,k\,q^7\,d_h\,\delta_h^2 + 1359\,q^8\,d_h\,\delta_h^2 + 360\,k^5\,q^2\,\eta\,d_h\,\delta_h^2 + 6012\,k^4\,q^3\,\eta\,d_h\,\delta_h^2 +$$
$$28\,872\,k^3\,q^4\,\eta\,d_h\,\delta_h^2 + 56\,322\,k^2\,q^5\,\eta\,d_h\,\delta_h^2 + 49\,362\,k\,q^6\,\eta\,d_h\,\delta_h^2 + 15\,912\,q^7\,\eta\,d_h\,\delta_h^2 +$$
$$342\,k^5\,q\,\eta^2\,d_h\,\delta_h^2 + 9516\,k^4\,q^2\,\eta^2\,d_h\,\delta_h^2 + 67\,120\,k^3\,q^3\,\eta^2\,d_h\,\delta_h^2 + 177\,249\,k^2\,q^4\,\eta^2\,d_h\,\delta_h^2 +$$
$$196\,788\,k\,q^5\,\eta^2\,d_h\,\delta_h^2 + 77\,265\,q^6\,\eta^2\,d_h\,\delta_h^2 + 102\,k^5\,\eta^3\,d_h\,\delta_h^2 + 6318\,k^4\,q\,\eta^3\,d_h\,\delta_h^2 +$$
$$73\,440\,k^3\,q^2\,\eta^3\,d_h\,\delta_h^2 + 279\,852\,k^2\,q^3\,\eta^3\,d_h\,\delta_h^2 + 411\,594\,k\,q^4\,\eta^3\,d_h\,\delta_h^2 + 202\,614\,q^5\,\eta^3\,d_h\,\delta_h^2 +$$
$$1466\,k^4\,\eta^4\,d_h\,\delta_h^2 + 37\,484\,k^3\,q\,\eta^4\,d_h\,\delta_h^2 + 231\,852\,k^2\,q^2\,\eta^4\,d_h\,\delta_h^2 + 483\,148\,k\,q^3\,\eta^4\,d_h\,\delta_h^2 +$$
$$311\,218\,q^4\,\eta^4\,d_h\,\delta_h^2 + 7004\,k^3\,\eta^5\,d_h\,\delta_h^2 + 93\,948\,k^2\,q\,\eta^5\,d_h\,\delta_h^2 + 312\,756\,k\,q^2\,\eta^5\,d_h\,\delta_h^2 +$$
$$281\,844\,q^3\,\eta^5\,d_h\,\delta_h^2 + 14\,032\,k^2\,\eta^6\,d_h\,\delta_h^2 + 99\,808\,k\,q\,\eta^6\,d_h\,\delta_h^2 + 141\,904\,q^2\,\eta^6\,d_h\,\delta_h^2 +$$
$$11\,136\,k\,\eta^7\,d_h\,\delta_h^2 + 33\,408\,q\,\eta^7\,d_h\,\delta_h^2 + 2048\,\eta^8\,d_h\,\delta_h^2 + 216\,k^5\,q^2\,d_h^2\,\delta_h^2 + 3738\,k^4\,q^3\,d_h^2\,\delta_h^2 +$$
$$18\,063\,k^3\,q^4\,d_h^2\,\delta_h^2 + 35\,199\,k^2\,q^5\,d_h^2\,\delta_h^2 + 30\,825\,k\,q^6\,d_h^2\,\delta_h^2 + 9927\,q^7\,d_h^2\,\delta_h^2 + 432\,k^5\,q\,\eta\,d_h^2\,\delta_h^2 +$$
$$12\,294\,k^4\,q^2\,\eta\,d_h^2\,\delta_h^2 + 87\,204\,k^3\,q^3\,\eta\,d_h^2\,\delta_h^2 + 230\,184\,k^2\,q^4\,\eta\,d_h^2\,\delta_h^2 + 255\,348\,k\,q^5\,\eta\,d_h^2\,\delta_h^2 +$$
$$100\,314\,q^6\,\eta\,d_h^2\,\delta_h^2 + 204\,k^5\,\eta^2\,d_h^2\,\delta_h^2 + 12\,792\,k^4\,q\,\eta^2\,d_h^2\,\delta_h^2 + 149\,340\,k^3\,q^2\,\eta^2\,d_h^2\,\delta_h^2 +$$
$$569\,004\,k^2\,q^3\,\eta^2\,d_h^2\,\delta_h^2 + 836\,064\,k\,q^4\,\eta^2\,d_h^2\,\delta_h^2 + 412\,020\,q^5\,\eta^2\,d_h^2\,\delta_h^2 + 4176\,k^4\,\eta^3\,d_h^2\,\delta_h^2 +$$
$$106\,992\,k^3\,q\,\eta^3\,d_h^2\,\delta_h^2 + 661\,896\,k^2\,q^2\,\eta^3\,d_h^2\,\delta_h^2 + 1\,377\,888\,k\,q^3\,\eta^3\,d_h^2\,\delta_h^2 + 888\,408\,q^4\,\eta^3\,d_h^2\,\delta_h^2 +$$
$$26\,744\,k^3\,\eta^4\,d_h^2\,\delta_h^2 + 358\,824\,k^2\,q\,\eta^4\,d_h^2\,\delta_h^2 + 1\,193\,640\,k\,q^2\,\eta^4\,d_h^2\,\delta_h^2 + 1\,076\,152\,q^3\,\eta^4\,d_h^2\,\delta_h^2 +$$
$$71\,040\,k^2\,\eta^5\,d_h^2\,\delta_h^2 + 505\,344\,k\,q\,\eta^5\,d_h^2\,\delta_h^2 + 718\,464\,q^2\,\eta^5\,d_h^2\,\delta_h^2 + 78\,336\,k\,\eta^6\,d_h^2\,\delta_h^2 +$$
$$235\,008\,q\,\eta^6\,d_h^2\,\delta_h^2 + 26\,112\,\eta^7\,d_h^2\,\delta_h^2 + 168\,k^5\,q\,d_h^3\,\delta_h^2 + 4986\,k^4\,q^2\,d_h^3\,\delta_h^2 + 35\,856\,k^3\,q^3\,d_h^3\,\delta_h^2 +$$
$$94\,791\,k^2\,q^4\,d_h^3\,\delta_h^2 + 105\,000\,k\,q^5\,d_h^3\,\delta_h^2 + 41\,155\,q^6\,d_h^3\,\delta_h^2 + 168\,k^5\,\eta\,d_h^3\,\delta_h^2 + 10\,812\,k^4\,q\,\eta\,d_h^3\,\delta_h^2 +$$
$$127\,512\,k^3\,q^2\,\eta\,d_h^3\,\delta_h^2 + 486\,732\,k^2\,q^3\,\eta\,d_h^3\,\delta_h^2 + 714\,582\,k\,q^4\,\eta\,d_h^3\,\delta_h^2 + 351\,930\,q^5\,\eta\,d_h^3\,\delta_h^2 +$$
$$5554\,k^4\,\eta^2\,d_h^3\,\delta_h^2 + 143\,080\,k^3\,q\,\eta^2\,d_h^3\,\delta_h^2 + 886\,174\,k^2\,q^2\,\eta^2\,d_h^3\,\delta_h^2 + 1\,843\,516\,k\,q^3\,\eta^2\,d_h^3\,\delta_h^2 +$$
$$1\,188\,996\,q^4\,\eta^2\,d_h^3\,\delta_h^2 + 50\,336\,k^3\,\eta^3\,d_h^3\,\delta_h^2 + 674\,828\,k^2\,q\,\eta^3\,d_h^3\,\delta_h^2 + 2\,242\,616\,k\,q^2\,\eta^3\,d_h^3\,\delta_h^2 +$$
$$2\,023\,260\,q^3\,\eta^3\,d_h^3\,\delta_h^2 + 179\,308\,k^2\,\eta^4\,d_h^3\,\delta_h^2 + 1\,272\,760\,k\,q\,\eta^4\,d_h^3\,\delta_h^2 + 1\,810\,684\,q^2\,\eta^4\,d_h^3\,\delta_h^2 +$$
$$263\,680\,k\,\eta^5\,d_h^3\,\delta_h^2 + 791\,040\,q\,\eta^5\,d_h^3\,\delta_h^2 + 125\,696\,\eta^6\,d_h^3\,\delta_h^2 + 48\,k^5\,d_h^4\,\delta_h^2 + 3225\,k^4\,q\,d_h^4\,\delta_h^2 +$$
$$38\,745\,k^3\,q^2\,d_h^4\,\delta_h^2 + 148\,575\,k^2\,q^3\,d_h^4\,\delta_h^2 + 217\,935\,k\,q^4\,d_h^4\,\delta_h^2 + 107\,040\,q^5\,d_h^4\,\delta_h^2 + 3465\,k^4\,\eta\,d_h^4\,\delta_h^2 +$$
$$90\,390\,k^3\,q\,\eta\,d_h^4\,\delta_h^2 + 561\,960\,k^2\,q^2\,\eta\,d_h^4\,\delta_h^2 + 1\,168\,890\,k\,q^3\,\eta\,d_h^4\,\delta_h^2 + 753\,135\,q^4\,\eta\,d_h^4\,\delta_h^2 +$$
$$49\,904\,k^3\,\eta^2\,d_h^4\,\delta_h^2 + 670\,136\,k^2\,q\,\eta^2\,d_h^4\,\delta_h^2 + 2\,226\,416\,k\,q^2\,\eta^2\,d_h^4\,\delta_h^2 + 2\,008\,744\,q^3\,\eta^2\,d_h^4\,\delta_h^2 +$$
$$250\,568\,k^2\,\eta^3\,d_h^4\,\delta_h^2 + 1\,775\,984\,k\,q\,\eta^3\,d_h^4\,\delta_h^2 + 2\,527\,688\,q^2\,\eta^3\,d_h^4\,\delta_h^2 + 494\,784\,k\,\eta^4\,d_h^4\,\delta_h^2 +$$
$$1\,484\,352\,q\,\eta^4\,d_h^4\,\delta_h^2 + 317\,824\,\eta^5\,d_h^4\,\delta_h^2 + 813\,k^4\,d_h^5\,\delta_h^2 + 21\,660\,k^3\,q\,d_h^5\,\delta_h^2 + 135\,639\,k^2\,q^2\,d_h^5\,\delta_h^2 +$$
$$282\,240\,k\,q^3\,d_h^5\,\delta_h^2 + 181\,398\,q^4\,d_h^5\,\delta_h^2 + 24\,912\,k^3\,\eta\,d_h^5\,\delta_h^2 + 336\,258\,k^2\,q\,\eta\,d_h^5\,\delta_h^2 +$$
$$1\,117\,998\,k\,q^2\,\eta\,d_h^5\,\delta_h^2 + 1\,007\,832\,q^3\,\eta\,d_h^5\,\delta_h^2 + 197\,137\,k^2\,\eta^2\,d_h^5\,\delta_h^2 + 1\,397\,218\,k\,q\,\eta^2\,d_h^5\,\delta_h^2 +$$
$$1\,988\,629\,q^2\,\eta^2\,d_h^5\,\delta_h^2 + 547\,992\,k\,\eta^3\,d_h^5\,\delta_h^2 + 1\,643\,976\,q\,\eta^3\,d_h^5\,\delta_h^2 + 474\,768\,\eta^4\,d_h^5\,\delta_h^2 +$$
$$4909\,k^3\,d_h^6\,\delta_h^2 + 66\,873\,k^2\,q\,d_h^6\,\delta_h^2 + 222\,747\,k\,q^2\,d_h^6\,\delta_h^2 + 200\,431\,q^3\,d_h^6\,\delta_h^2 + 81\,600\,k^2\,\eta\,d_h^6\,\delta_h^2 +$$
$$579\,240\,k\,q\,\eta\,d_h^6\,\delta_h^2 + 824\,040\,q^2\,\eta\,d_h^6\,\delta_h^2 + 356\,280\,k\,\eta^2\,d_h^6\,\delta_h^2 + 1\,068\,840\,q\,\eta^2\,d_h^6\,\delta_h^2 +$$
$$435\,200\,\eta^3\,d_h^6\,\delta_h^2 + 13\,761\,k^2\,d_h^7\,\delta_h^2 + 97\,992\,k\,q\,d_h^7\,\delta_h^2 + 139\,275\,q^2\,d_h^7\,\delta_h^2 + 125\,514\,k\,\eta\,d_h^7\,\delta_h^2 +$$

$$376\,542\,q\,\eta\,d_h^7\,\delta_h^2 + 240\,744\,\eta^2\,d_h^7\,\delta_h^2 + 18\,414\,k\,d_h^8\,\delta_h^2 + 55\,242\,q\,d_h^8\,\delta_h^2 + 73\,656\,\eta\,d_h^8\,\delta_h^2 +$$
$$9533\,d_h^9\,\delta_h^2 + 16\,k^5\,q^3\,\gamma_h\,\delta_h^2 + 224\,k^4\,q^4\,\gamma_h\,\delta_h^2 + 880\,k^3\,q^5\,\gamma_h\,\delta_h^2 + 1426\,k^2\,q^6\,\gamma_h\,\delta_h^2 +$$
$$1052\,k\,q^7\,\gamma_h\,\delta_h^2 + 288\,q^8\,\gamma_h\,\delta_h^2 + 56\,k^5\,q^2\,\eta\,\gamma_h\,\delta_h^2 + 1048\,k^4\,q^3\,\eta\,\gamma_h\,\delta_h^2 + 5470\,k^3\,q^4\,\eta\,\gamma_h\,\delta_h^2 +$$
$$11\,353\,k^2\,q^5\,\eta\,\gamma_h\,\delta_h^2 + 10\,273\,k\,q^6\,\eta\,\gamma_h\,\delta_h^2 + 3366\,q^7\,\eta\,\gamma_h\,\delta_h^2 + 60\,k^5\,q\,\eta^2\,\gamma_h\,\delta_h^2 + 1768\,k^4\,q^2\,\eta^2\,\gamma_h\,\delta_h^2 +$$
$$13\,042\,k^3\,q^3\,\eta^2\,\gamma_h\,\delta_h^2 + 35\,967\,k^2\,q^4\,\eta^2\,\gamma_h\,\delta_h^2 + 41\,020\,k\,q^5\,\eta^2\,\gamma_h\,\delta_h^2 + 16\,293\,q^6\,\eta^2\,\gamma_h\,\delta_h^2 +$$
$$18\,k^5\,\eta^3\,\gamma_h\,\delta_h^2 + 1234\,k^4\,q\,\eta^3\,\gamma_h\,\delta_h^2 + 14\,724\,k^3\,q^2\,\eta^3\,\gamma_h\,\delta_h^2 + 57\,622\,k^2\,q^3\,\eta^3\,\gamma_h\,\delta_h^2 +$$
$$86\,328\,k\,q^4\,\eta^3\,\gamma_h\,\delta_h^2 + 42\,618\,q^5\,\eta^3\,\gamma_h\,\delta_h^2 + 282\,k^4\,\eta^4\,\gamma_h\,\delta_h^2 + 7660\,k^3\,q\,\eta^4\,\gamma_h\,\delta_h^2 +$$
$$48\,472\,k^2\,q^2\,\eta^4\,\gamma_h\,\delta_h^2 + 102\,144\,k\,q^3\,\eta^4\,\gamma_h\,\delta_h^2 + 65\,274\,q^4\,\eta^4\,\gamma_h\,\delta_h^2 + 1380\,k^3\,\eta^5\,\gamma_h\,\delta_h^2 +$$
$$19\,620\,k^2\,q\,\eta^5\,\gamma_h\,\delta_h^2 + 66\,220\,k\,q^2\,\eta^5\,\gamma_h\,\delta_h^2 + 58\,572\,q^3\,\eta^5\,\gamma_h\,\delta_h^2 + 2736\,k^2\,\eta^6\,\gamma_h\,\delta_h^2 +$$
$$20\,512\,k\,q\,\eta^6\,\gamma_h\,\delta_h^2 + 28\,464\,q^2\,\eta^6\,\gamma_h\,\delta_h^2 + 1920\,k\,\eta^7\,\gamma_h\,\delta_h^2 + 5760\,q\,\eta^7\,\gamma_h\,\delta_h^2 + 56\,k^5\,q^2\,d_h\,\gamma_h\,\delta_h^2 +$$
$$1192\,k^4\,q^3\,d_h\,\gamma_h\,\delta_h^2 + 6430\,k^3\,q^4\,d_h\,\gamma_h\,\delta_h^2 + 13\,396\,k^2\,q^5\,d_h\,\gamma_h\,\delta_h^2 + 12\,088\,k\,q^6\,d_h\,\gamma_h\,\delta_h^2 +$$
$$3942\,q^7\,d_h\,\gamma_h\,\delta_h^2 + 128\,k^5\,q\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 4144\,k^4\,q^2\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 31\,584\,k^3\,q^3\,\eta\,d_h\,\gamma_h\,\delta_h^2 +$$
$$87\,774\,k^2\,q^4\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 100\,200\,k\,q^5\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 39\,882\,q^6\,\eta\,d_h\,\gamma_h\,\delta_h^2 + 66\,k^5\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 +$$
$$4558\,k^4\,q\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 + 55\,544\,k^3\,q^2\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 + 219\,056\,k^2\,q^3\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 + 329\,194\,k\,q^4\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 +$$
$$163\,662\,q^5\,\eta^2\,d_h\,\gamma_h\,\delta_h^2 + 1524\,k^4\,\eta^3\,d_h\,\gamma_h\,\delta_h^2 + 40\,740\,k^3\,q\,\eta^3\,d_h\,\gamma_h\,\delta_h^2 + 258\,020\,k^2\,q^2\,\eta^3\,d_h\,\gamma_h\,\delta_h^2 +$$
$$545\,260\,k\,q^3\,\eta^3\,d_h\,\gamma_h\,\delta_h^2 + 352\,152\,q^4\,\eta^3\,d_h\,\gamma_h\,\delta_h^2 + 10\,140\,k^3\,\eta^4\,d_h\,\gamma_h\,\delta_h^2 + 140\,628\,k^2\,q\,\eta^4\,d_h\,\gamma_h\,\delta_h^2 +$$
$$473\,428\,k\,q^2\,\eta^4\,d_h\,\gamma_h\,\delta_h^2 + 424\,284\,q^3\,\eta^4\,d_h\,\gamma_h\,\delta_h^2 + 27\,120\,k^2\,\eta^5\,d_h\,\gamma_h\,\delta_h^2 + 198\,016\,k\,q\,\eta^5\,d_h\,\gamma_h\,\delta_h^2 +$$
$$278\,640\,q^2\,\eta^5\,d_h\,\gamma_h\,\delta_h^2 + 28\,800\,k\,\eta^6\,d_h\,\gamma_h\,\delta_h^2 + 86\,400\,q\,\eta^6\,d_h\,\gamma_h\,\delta_h^2 + 7680\,\eta^7\,d_h\,\gamma_h\,\delta_h^2 +$$
$$64\,k^5\,q\,d_h^2\,\gamma_h\,\delta_h^2 + 2312\,k^4\,q^2\,d_h^2\,\gamma_h\,\delta_h^2 + 18\,312\,k^3\,q^3\,d_h^2\,\gamma_h\,\delta_h^2 + 51\,267\,k^2\,q^4\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$58\,419\,k\,q^5\,d_h^2\,\gamma_h\,\delta_h^2 + 23\,151\,q^6\,d_h^2\,\gamma_h\,\delta_h^2 + 72\,k^5\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 + 5304\,k^4\,q\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$66\,588\,k^3\,q^2\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 + 264\,978\,k^2\,q^3\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 + 398\,784\,k\,q^4\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 + 198\,558\,q^5\,\eta\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$2850\,k^4\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^2 + 76\,642\,k^3\,q\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^2 + 487\,648\,k^2\,q^2\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^2 + 1\,032\,904\,k\,q^3\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$670\,824\,q^4\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^2 + 27\,312\,k^3\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^2 + 374\,602\,k^2\,q\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^2 + 1\,260\,098\,k\,q^2\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$1\,138\,260\,q^3\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^2 + 98\,868\,k^2\,\eta^4\,d_h^2\,\gamma_h\,\delta_h^2 + 712\,160\,k\,q\,\eta^4\,d_h^2\,\gamma_h\,\delta_h^2 + 1\,009\,956\,q^2\,\eta^4\,d_h^2\,\gamma_h\,\delta_h^2 +$$
$$143\,616\,k\,\eta^5\,d_h^2\,\gamma_h\,\delta_h^2 + 430\,848\,q\,\eta^5\,d_h^2\,\gamma_h\,\delta_h^2 + 63\,744\,\eta^6\,d_h^2\,\gamma_h\,\delta_h^2 + 24\,k^5\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$1944\,k^4\,q\,d_h^3\,\gamma_h\,\delta_h^2 + 25\,396\,k^3\,q^2\,d_h^3\,\gamma_h\,\delta_h^2 + 102\,140\,k^2\,q^3\,d_h^3\,\gamma_h\,\delta_h^2 + 153\,674\,k\,q^4\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$76\,230\,q^5\,d_h^3\,\gamma_h\,\delta_h^2 + 2208\,k^4\,\eta\,d_h^3\,\gamma_h\,\delta_h^2 + 60\,784\,k^3\,q\,\eta\,d_h^3\,\gamma_h\,\delta_h^2 + 390\,108\,k^2\,q^2\,\eta\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$827\,888\,k\,q^3\,\eta\,d_h^3\,\gamma_h\,\delta_h^2 + 538\,308\,q^4\,\eta\,d_h^3\,\gamma_h\,\delta_h^2 + 34\,320\,k^3\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^2 + 470\,192\,k^2\,q\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$1\,582\,684\,k\,q^2\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^2 + 1\,435\,476\,q^3\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^2 + 176\,436\,k^2\,\eta^3\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$1\,262\,456\,k\,q\,\eta^3\,d_h^3\,\gamma_h\,\delta_h^2 + 1\,798\,356\,q^2\,\eta^3\,d_h^3\,\gamma_h\,\delta_h^2 + 347\,760\,k\,\eta^4\,d_h^3\,\gamma_h\,\delta_h^2 + 1\,043\,280\,q\,\eta^4\,d_h^3\,\gamma_h\,\delta_h^2 +$$
$$216\,576\,\eta^5\,d_h^3\,\gamma_h\,\delta_h^2 + 600\,k^4\,d_h^4\,\gamma_h\,\delta_h^2 + 17\,176\,k^3\,q\,d_h^4\,\gamma_h\,\delta_h^2 + 111\,660\,k^2\,q^2\,d_h^4\,\gamma_h\,\delta_h^2 +$$
$$237\,302\,k\,q^3\,d_h^4\,\gamma_h\,\delta_h^2 + 153\,855\,q^4\,d_h^4\,\gamma_h\,\delta_h^2 + 20\,310\,k^3\,\eta\,d_h^4\,\gamma_h\,\delta_h^2 + 280\,157\,k^2\,q\,\eta\,d_h^4\,\gamma_h\,\delta_h^2 +$$
$$944\,809\,k\,q^2\,\eta\,d_h^4\,\gamma_h\,\delta_h^2 + 857\,730\,q^3\,\eta\,d_h^4\,\gamma_h\,\delta_h^2 + 165\,837\,k^2\,\eta^2\,d_h^4\,\gamma_h\,\delta_h^2 + 1\,184\,064\,k\,q\,\eta^2\,d_h^4\,\gamma_h\,\delta_h^2 +$$
$$1\,690\,497\,q^2\,\eta^2\,d_h^4\,\gamma_h\,\delta_h^2 + 462\,840\,k\,\eta^3\,d_h^4\,\gamma_h\,\delta_h^2 + 1\,388\,520\,q\,\eta^3\,d_h^4\,\gamma_h\,\delta_h^2 + 394\,704\,\eta^4\,d_h^4\,\gamma_h\,\delta_h^2 +$$
$$4542\,k^3\,d_h^5\,\gamma_h\,\delta_h^2 + 63\,544\,k^2\,q\,d_h^5\,\gamma_h\,\delta_h^2 + 214\,928\,k\,q^2\,d_h^5\,\gamma_h\,\delta_h^2 + 194\,754\,q^3\,d_h^5\,\gamma_h\,\delta_h^2 +$$
$$78\,606\,k^2\,\eta\,d_h^5\,\gamma_h\,\delta_h^2 + 561\,936\,k\,q\,\eta\,d_h^5\,\gamma_h\,\delta_h^2 + 802\,746\,q^2\,\eta\,d_h^5\,\gamma_h\,\delta_h^2 + 346\,188\,k\,\eta^2\,d_h^5\,\gamma_h\,\delta_h^2 +$$
$$1\,038\,564\,q\,\eta^2\,d_h^5\,\gamma_h\,\delta_h^2 + 419\,232\,\eta^3\,d_h^5\,\gamma_h\,\delta_h^2 + 14\,727\,k^2\,d_h^6\,\gamma_h\,\delta_h^2 + 105\,715\,k\,q\,d_h^6\,\gamma_h\,\delta_h^2 +$$
$$150\,885\,q^2\,d_h^6\,\gamma_h\,\delta_h^2 + 136\,158\,k\,\eta\,d_h^6\,\gamma_h\,\delta_h^2 + 408\,474\,q\,\eta\,d_h^6\,\gamma_h\,\delta_h^2 + 260\,088\,\eta^2\,d_h^6\,\gamma_h\,\delta_h^2 +$$
$$21\,798\,k\,d_h^7\,\gamma_h\,\delta_h^2 + 65\,394\,q\,d_h^7\,\gamma_h\,\delta_h^2 + 87\,192\,\eta\,d_h^7\,\gamma_h\,\delta_h^2 + 12\,141\,d_h^8\,\gamma_h\,\delta_h^2 + 52\,k^4\,q^3\,\gamma_h^2\,\delta_h^2 +$$
$$388\,k^3\,q^4\,\gamma_h^2\,\delta_h^2 + 907\,k^2\,q^5\,\gamma_h^2\,\delta_h^2 + 861\,k\,q^6\,\gamma_h^2\,\delta_h^2 + 288\,q^7\,\gamma_h^2\,\delta_h^2 + 196\,k^4\,q^2\,\eta\,\gamma_h^2\,\delta_h^2 +$$
$$1984\,k^3\,q^3\,\eta\,\gamma_h^2\,\delta_h^2 + 6112\,k^2\,q^4\,\eta\,\gamma_h^2\,\delta_h^2 + 7302\,k\,q^5\,\eta\,\gamma_h^2\,\delta_h^2 + 2970\,q^6\,\eta\,\gamma_h^2\,\delta_h^2 + 228\,k^4\,q\,\eta^2\,\gamma_h^2\,\delta_h^2 +$$
$$3626\,k^3\,q^2\,\eta^2\,\gamma_h^2\,\delta_h^2 + 15\,636\,k^2\,q^3\,\eta^2\,\gamma_h^2\,\delta_h^2 + 24\,366\,k\,q^4\,\eta^2\,\gamma_h^2\,\delta_h^2 + 12\,264\,q^5\,\eta^2\,\gamma_h^2\,\delta_h^2 +$$
$$72\,k^4\,\eta^3\,\gamma_h^2\,\delta_h^2 + 2688\,k^3\,q\,\eta^3\,\gamma_h^2\,\delta_h^2 + 18\,644\,k^2\,q^2\,\eta^3\,\gamma_h^2\,\delta_h^2 + 40\,524\,k\,q^3\,\eta^3\,\gamma_h^2\,\delta_h^2 + 26\,172\,q^4\,\eta^3\,\gamma_h^2\,\delta_h^2 +$$

$$624\,k^3\,\eta^4\,\gamma_h^2\,\delta_h^2 + 9972\,k^2\,q\,\eta^4\,\gamma_h^2\,\delta_h^2 + 34\,596\,k\,q^2\,\eta^4\,\gamma_h^2\,\delta_h^2 + 30\,600\,q^3\,\eta^4\,\gamma_h^2\,\delta_h^2 + 1728\,k^2\,\eta^5\,\gamma_h^2\,\delta_h^2 +$$
$$13\,536\,k\,q\,\eta^5\,\gamma_h^2\,\delta_h^2 + 18\,624\,q^2\,\eta^5\,\gamma_h^2\,\delta_h^2 + 1536\,k\,\eta^6\,\gamma_h^2\,\delta_h^2 + 4608\,q\,\eta^6\,\gamma_h^2\,\delta_h^2 + 196\,k^4\,q^2\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$2134\,k^3\,q^3\,d_h\,\gamma_h^2\,\delta_h^2 + 6646\,k^2\,q^4\,d_h\,\gamma_h^2\,\delta_h^2 + 7926\,k\,q^5\,d_h\,\gamma_h^2\,\delta_h^2 + 3210\,q^6\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$480\,k^4\,q\,\eta\,d_h\,\gamma_h^2\,\delta_h^2 + 8046\,k^3\,q^2\,\eta\,d_h\,\gamma_h^2\,\delta_h^2 + 35\,226\,k^2\,q^3\,\eta\,d_h\,\gamma_h^2\,\delta_h^2 + 55\,176\,k\,q^4\,\eta\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$27\,972\,q^5\,\eta\,d_h\,\gamma_h^2\,\delta_h^2 + 264\,k^4\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^2 + 9516\,k^3\,q\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^2 + 66\,104\,k^2\,q^2\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$144\,576\,k\,q^3\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^2 + 94\,824\,q^4\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^2 + 3348\,k^3\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^2 + 50\,904\,k^2\,q\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$176\,112\,k\,q^2\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^2 + 159\,108\,q^3\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^2 + 12\,912\,k^2\,\eta^4\,d_h\,\gamma_h^2\,\delta_h^2 + 96\,912\,k\,q\,\eta^4\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$136\,464\,q^2\,\eta^4\,d_h\,\gamma_h^2\,\delta_h^2 + 17\,856\,k\,\eta^5\,d_h\,\gamma_h^2\,\delta_h^2 + 53\,568\,q\,\eta^5\,d_h\,\gamma_h^2\,\delta_h^2 + 6144\,\eta^6\,d_h\,\gamma_h^2\,\delta_h^2 +$$
$$240\,k^4\,q\,d_h^2\,\gamma_h^2\,\delta_h^2 + 4290\,k^3\,q^2\,d_h^2\,\gamma_h^2\,\delta_h^2 + 19\,038\,k^2\,q^3\,d_h^2\,\gamma_h^2\,\delta_h^2 + 29\,820\,k\,q^4\,d_h^2\,\gamma_h^2\,\delta_h^2 +$$
$$15\,066\,q^5\,d_h^2\,\gamma_h^2\,\delta_h^2 + 288\,k^4\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^2 + 10\,608\,k^3\,q\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^2 + 74\,370\,k^2\,q^2\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^2 +$$
$$163\,320\,k\,q^3\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^2 + 107\,748\,q^4\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^2 + 6084\,k^3\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^2 + 90\,906\,k^2\,q\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^2 +$$
$$314\,586\,k\,q^2\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^2 + 287\,424\,q^3\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^2 + 33\,828\,k^2\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h^2 + 249\,096\,k\,q\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h^2 +$$
$$354\,948\,q^2\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h^2 + 66\,096\,k\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h^2 + 198\,288\,q\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h^2 + 37\,632\,\eta^5\,d_h^2\,\gamma_h^2\,\delta_h^2 +$$
$$96\,k^4\,d_h^3\,\gamma_h^2\,\delta_h^2 + 3744\,k^3\,q\,d_h^3\,\gamma_h^2\,\delta_h^2 + 26\,634\,k^2\,q^2\,d_h^3\,\gamma_h^2\,\delta_h^2 + 58\,584\,k\,q^3\,d_h^3\,\gamma_h^2\,\delta_h^2 +$$
$$38\,556\,q^4\,d_h^3\,\gamma_h^2\,\delta_h^2 + 4560\,k^3\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^2 + 68\,196\,k^2\,q\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^2 + 236\,436\,k\,q^2\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^2 +$$
$$216\,960\,q^3\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^2 + 40\,716\,k^2\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h^2 + 297\,408\,k\,q\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h^2 + 426\,396\,q^2\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h^2 +$$
$$114\,720\,k\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h^2 + 344\,160\,q\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h^2 + 93\,888\,\eta^4\,d_h^3\,\gamma_h^2\,\delta_h^2 + 1200\,k^3\,d_h^4\,\gamma_h^2\,\delta_h^2 +$$
$$18\,213\,k^2\,q\,d_h^4\,\gamma_h^2\,\delta_h^2 + 63\,321\,k\,q^2\,d_h^4\,\gamma_h^2\,\delta_h^2 + 58\,020\,q^3\,d_h^4\,\gamma_h^2\,\delta_h^2 + 22\,950\,k^2\,\eta\,d_h^4\,\gamma_h^2\,\delta_h^2 +$$
$$167\,394\,k\,q\,\eta\,d_h^4\,\gamma_h^2\,\delta_h^2 + 240\,570\,q^2\,\eta\,d_h^4\,\gamma_h^2\,\delta_h^2 + 103\,140\,k\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h^2 + 309\,420\,q\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h^2 +$$
$$122\,400\,\eta^3\,d_h^4\,\gamma_h^2\,\delta_h^2 + 4878\,k^2\,d_h^5\,\gamma_h^2\,\delta_h^2 + 35\,706\,k\,q\,d_h^5\,\gamma_h^2\,\delta_h^2 + 51\,282\,q^2\,d_h^5\,\gamma_h^2\,\delta_h^2 +$$
$$46\,404\,k\,\eta\,d_h^5\,\gamma_h^2\,\delta_h^2 + 139\,212\,q\,\eta\,d_h^5\,\gamma_h^2\,\delta_h^2 + 87\,888\,\eta^2\,d_h^5\,\gamma_h^2\,\delta_h^2 + 8214\,k\,d_h^6\,\gamma_h^2\,\delta_h^2 +$$
$$24\,642\,q\,d_h^6\,\gamma_h^2\,\delta_h^2 + 32\,856\,\eta\,d_h^6\,\gamma_h^2\,\delta_h^2 + 4968\,d_h^7\,\gamma_h^2\,\delta_h^2 + 38\,k^3\,q^3\,\gamma_h^3\,\delta_h^2 + 150\,k^2\,q^4\,\gamma_h^3\,\delta_h^2 +$$
$$192\,k\,q^5\,\gamma_h^3\,\delta_h^2 + 80\,q^6\,\gamma_h^3\,\delta_h^2 + 150\,k^3\,q^2\,\eta\,\gamma_h^3\,\delta_h^2 + 834\,k^2\,q^3\,\eta\,\gamma_h^3\,\delta_h^2 + 1392\,k\,q^4\,\eta\,\gamma_h^3\,\delta_h^2 +$$
$$720\,q^5\,\eta\,\gamma_h^3\,\delta_h^2 + 184\,k^3\,q\,\eta^2\,\gamma_h^3\,\delta_h^2 + 1624\,k^2\,q^2\,\eta^2\,\gamma_h^3\,\delta_h^2 + 3744\,k\,q^3\,\eta^2\,\gamma_h^3\,\delta_h^2 + 2460\,q^4\,\eta^2\,\gamma_h^3\,\delta_h^2 +$$
$$60\,k^3\,\eta^3\,\gamma_h^3\,\delta_h^2 + 1244\,k^2\,q\,\eta^3\,\gamma_h^3\,\delta_h^2 + 4532\,k\,q^2\,\eta^3\,\gamma_h^3\,\delta_h^2 + 4020\,q^3\,\eta^3\,\gamma_h^3\,\delta_h^2 + 280\,k^2\,\eta^4\,\gamma_h^3\,\delta_h^2 +$$
$$2320\,k\,q\,\eta^4\,\gamma_h^3\,\delta_h^2 + 3160\,q^2\,\eta^4\,\gamma_h^3\,\delta_h^2 + 320\,k\,\eta^5\,\gamma_h^3\,\delta_h^2 + 960\,q\,\eta^5\,\gamma_h^3\,\delta_h^2 + 150\,k^3\,q^2\,d_h\,\gamma_h^3\,\delta_h^2 +$$
$$834\,k^2\,q^3\,d_h\,\gamma_h^3\,\delta_h^2 + 1392\,k\,q^4\,d_h\,\gamma_h^3\,\delta_h^2 + 720\,q^5\,d_h\,\gamma_h^3\,\delta_h^2 + 384\,k^3\,q\,\eta\,d_h\,\gamma_h^3\,\delta_h^2 + 3384\,k^2\,q^2\,\eta\,d_h\,\gamma_h^3\,\delta_h^2 +$$
$$7872\,k\,q^3\,\eta\,d_h\,\gamma_h^3\,\delta_h^2 + 5280\,q^4\,\eta\,d_h\,\gamma_h^3\,\delta_h^2 + 220\,k^3\,\eta^2\,d_h\,\gamma_h^3\,\delta_h^2 + 4220\,k^2\,q\,\eta^2\,d_h\,\gamma_h^3\,\delta_h^2 +$$
$$15\,380\,k\,q^2\,\eta^2\,d_h\,\gamma_h^3\,\delta_h^2 + 14\,100\,q^3\,\eta^2\,d_h\,\gamma_h^3\,\delta_h^2 + 1520\,k^2\,\eta^3\,d_h\,\gamma_h^3\,\delta_h^2 + 11\,936\,k\,q\,\eta^3\,d_h\,\gamma_h^3\,\delta_h^2 +$$
$$16\,880\,q^2\,\eta^3\,d_h\,\gamma_h^3\,\delta_h^2 + 2880\,k\,\eta^4\,d_h\,\gamma_h^3\,\delta_h^2 + 8640\,q\,\eta^4\,d_h\,\gamma_h^3\,\delta_h^2 + 1280\,\eta^5\,d_h\,\gamma_h^3\,\delta_h^2 +$$
$$192\,k^3\,q\,d_h^2\,\gamma_h^3\,\delta_h^2 + 1692\,k^2\,q^2\,d_h^2\,\gamma_h^3\,\delta_h^2 + 3936\,k\,q^3\,d_h^2\,\gamma_h^3\,\delta_h^2 + 2640\,q^4\,d_h^2\,\gamma_h^3\,\delta_h^2 + 240\,k^3\,\eta\,d_h^2\,\gamma_h^3\,\delta_h^2 +$$
$$4464\,k^2\,q\,\eta\,d_h^2\,\gamma_h^3\,\delta_h^2 + 16\,272\,k\,q^2\,\eta\,d_h^2\,\gamma_h^3\,\delta_h^2 + 15\,120\,q^3\,\eta\,d_h^2\,\gamma_h^3\,\delta_h^2 + 2680\,k^2\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h^2 +$$
$$20\,560\,k\,q\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h^2 + 29\,560\,q^2\,\eta^2\,d_h^2\,\gamma_h^3\,\delta_h^2 + 7680\,k\,\eta^3\,d_h^2\,\gamma_h^3\,\delta_h^2 + 23\,040\,q\,\eta^3\,d_h^2\,\gamma_h^3\,\delta_h^2 +$$
$$5760\,\eta^4\,d_h^2\,\gamma_h^3\,\delta_h^2 + 80\,k^3\,d_h^3\,\gamma_h^3\,\delta_h^2 + 1488\,k^2\,q\,d_h^3\,\gamma_h^3\,\delta_h^2 + 5424\,k\,q^2\,d_h^3\,\gamma_h^3\,\delta_h^2 + 5040\,q^3\,d_h^3\,\gamma_h^3\,\delta_h^2 +$$
$$1920\,k^2\,\eta\,d_h^3\,\gamma_h^3\,\delta_h^2 + 14\,592\,k\,q\,\eta\,d_h^3\,\gamma_h^3\,\delta_h^2 + 21\,120\,q^2\,\eta\,d_h^3\,\gamma_h^3\,\delta_h^2 + 8960\,k\,\eta^2\,d_h^3\,\gamma_h^3\,\delta_h^2 +$$
$$26\,880\,q\,\eta^2\,d_h^3\,\gamma_h^3\,\delta_h^2 + 10\,240\,\eta^3\,d_h^3\,\gamma_h^3\,\delta_h^2 + 480\,k^2\,d_h^4\,\gamma_h^3\,\delta_h^2 + 3648\,k\,q\,d_h^4\,\gamma_h^3\,\delta_h^2 + 5280\,q^2\,d_h^4\,\gamma_h^3\,\delta_h^2 +$$
$$4800\,k\,\eta\,d_h^4\,\gamma_h^3\,\delta_h^2 + 14\,400\,q\,\eta\,d_h^4\,\gamma_h^3\,\delta_h^2 + 8960\,\eta^2\,d_h^4\,\gamma_h^3\,\delta_h^2 + 960\,k\,d_h^5\,\gamma_h^3\,\delta_h^2 + 2880\,q\,d_h^5\,\gamma_h^3\,\delta_h^2 +$$
$$3840\,\eta\,d_h^5\,\gamma_h^3\,\delta_h^2 + 640\,d_h^6\,\gamma_h^3\,\delta_h^2 + 8\,k^5\,q^3\,\delta_h^3 + 96\,k^4\,q^4\,\delta_h^3 + 330\,k^3\,q^5\,\delta_h^3 + 491\,k^2\,q^6\,\delta_h^3 + 354\,k\,q^7\,\delta_h^3 +$$
$$96\,q^8\,\delta_h^3 + 24\,k^5\,q^2\,\eta\,\delta_h^3 + 424\,k^4\,q^3\,\eta\,\delta_h^3 + 2034\,k^3\,q^4\,\eta\,\delta_h^3 + 3936\,k^2\,q^5\,\eta\,\delta_h^3 + 3460\,k\,q^6\,\eta\,\delta_h^3 +$$
$$1122\,q^7\,\eta\,\delta_h^3 + 22\,k^5\,q\,\eta^2\,\delta_h^3 + 664\,k^4\,q^2\,\eta^2\,\delta_h^3 + 4728\,k^3\,q^3\,\eta^2\,\delta_h^3 + 12\,427\,k^2\,q^4\,\eta^2\,\delta_h^3 +$$
$$13\,792\,k\,q^5\,\eta^2\,\delta_h^3 + 5431\,q^6\,\eta^2\,\delta_h^3 + 6\,k^5\,\eta^3\,\delta_h^3 + 430\,k^4\,q\,\eta^3\,\delta_h^3 + 5152\,k^3\,q^2\,\eta^3\,\delta_h^3 +$$
$$19\,684\,k^2\,q^3\,\eta^3\,\delta_h^3 + 28\,906\,k\,q^4\,\eta^3\,\delta_h^3 + 14\,206\,q^5\,\eta^3\,\delta_h^3 + 94\,k^4\,\eta^4\,\delta_h^3 + 2588\,k^3\,q\,\eta^4\,\delta_h^3 +$$
$$16\,300\,k^2\,q^2\,\eta^4\,\delta_h^3 + 33\,996\,k\,q^3\,\eta^4\,\delta_h^3 + 21\,758\,q^4\,\eta^4\,\delta_h^3 + 460\,k^3\,\eta^5\,\delta_h^3 + 6508\,k^2\,q\,\eta^5\,\delta_h^3 +$$

$$21\,892\,k\,q^2\,\eta^5\,\delta_h^3 + 19\,524\,q^3\,\eta^5\,\delta_h^3 + 912\,k^2\,\eta^6\,\delta_h^3 + 6752\,k\,q\,\eta^6\,\delta_h^3 + 9488\,q^2\,\eta^6\,\delta_h^3 + 640\,k\,\eta^7\,\delta_h^3 +$$
$$1920\,q\,\eta^7\,\delta_h^3 + 24\,k^5\,q^2\,d_h\,\delta_h^3 + 488\,k^4\,q^3\,d_h\,\delta_h^3 + 2418\,k^3\,q^4\,d_h\,\delta_h^3 + 4692\,k^2\,q^5\,d_h\,\delta_h^3 +$$
$$4096\,k\,q^6\,d_h\,\delta_h^3 + 1314\,q^7\,d_h\,\delta_h^3 + 48\,k^5\,q\,\eta\,d_h\,\delta_h^3 + 1584\,k^4\,q^2\,\eta\,d_h\,\delta_h^3 + 11\,624\,k^3\,q^3\,\eta\,d_h\,\delta_h^3 +$$
$$30\,714\,k^2\,q^4\,\eta\,d_h\,\delta_h^3 + 33\,960\,k\,q^5\,\eta\,d_h\,\delta_h^3 + 13\,294\,q^6\,\eta\,d_h\,\delta_h^3 + 22\,k^5\,\eta^2\,d_h\,\delta_h^3 + 1614\,k^4\,q\,\eta^2\,d_h\,\delta_h^3 +$$
$$19\,752\,k^3\,q^2\,\eta^2\,d_h\,\delta_h^3 + 75\,884\,k^2\,q^3\,\eta^2\,d_h\,\delta_h^3 + 111\,230\,k\,q^4\,\eta^2\,d_h\,\delta_h^3 + 54\,554\,q^5\,\eta^2\,d_h\,\delta_h^3 +$$
$$508\,k^4\,\eta^3\,d_h\,\delta_h^3 + 13\,944\,k^3\,q\,\eta^3\,d_h\,\delta_h^3 + 87\,972\,k^2\,q^2\,\eta^3\,d_h\,\delta_h^3 + 183\,232\,k\,q^3\,\eta^3\,d_h\,\delta_h^3 +$$
$$117\,384\,q^4\,\eta^3\,d_h\,\delta_h^3 + 3380\,k^3\,\eta^4\,d_h\,\delta_h^3 + 47\,164\,k^2\,q\,\eta^4\,d_h\,\delta_h^3 + 158\,044\,k\,q^2\,\eta^4\,d_h\,\delta_h^3 +$$
$$141\,428\,q^3\,\eta^4\,d_h\,\delta_h^3 + 9040\,k^2\,\eta^5\,d_h\,\delta_h^3 + 65\,760\,k\,q\,\eta^5\,d_h\,\delta_h^3 + 92\,880\,q^2\,\eta^5\,d_h\,\delta_h^3 +$$
$$9600\,k\,\eta^6\,d_h\,\delta_h^3 + 28\,800\,q\,\eta^6\,d_h\,\delta_h^3 + 2560\,\eta^7\,d_h\,\delta_h^3 + 24\,k^5\,q\,d_h^2\,\delta_h^3 + 888\,k^4\,q^2\,d_h^2\,\delta_h^3 +$$
$$6788\,k^3\,q^3\,d_h^2\,\delta_h^3 + 18\,063\,k^2\,q^4\,d_h^2\,\delta_h^3 + 19\,884\,k\,q^5\,d_h^2\,\delta_h^3 + 7717\,q^6\,d_h^2\,\delta_h^3 + 24\,k^5\,\eta\,d_h^2\,\delta_h^3 +$$
$$1896\,k^4\,q\,\eta\,d_h^2\,\delta_h^3 + 23\,916\,k^3\,q^2\,\eta\,d_h^2\,\delta_h^3 + 92\,616\,k^2\,q^3\,\eta\,d_h^2\,\delta_h^3 + 135\,546\,k\,q^4\,\eta\,d_h^2\,\delta_h^3 +$$
$$66\,186\,q^5\,\eta\,d_h^2\,\delta_h^3 + 950\,k^4\,\eta^2\,d_h^2\,\delta_h^3 + 26\,464\,k^3\,q\,\eta^2\,d_h^2\,\delta_h^3 + 167\,830\,k^2\,q^2\,\eta^2\,d_h^2\,\delta_h^3 +$$
$$349\,428\,k\,q^3\,\eta^2\,d_h^2\,\delta_h^3 + 223\,608\,q^4\,\eta^2\,d_h^2\,\delta_h^3 + 9104\,k^3\,\eta^3\,d_h^2\,\delta_h^3 + 126\,572\,k^2\,q\,\eta^3\,d_h^2\,\delta_h^3 +$$
$$423\,464\,k\,q^2\,\eta^3\,d_h^2\,\delta_h^3 + 379\,420\,q^3\,\eta^3\,d_h^2\,\delta_h^3 + 32\,956\,k^2\,\eta^4\,d_h^2\,\delta_h^3 + 237\,784\,k\,q\,\eta^4\,d_h^2\,\delta_h^3 +$$
$$336\,652\,q^2\,\eta^4\,d_h^2\,\delta_h^3 + 47\,872\,k\,\eta^5\,d_h^2\,\delta_h^3 + 143\,616\,q\,\eta^5\,d_h^2\,\delta_h^3 + 21\,248\,\eta^6\,d_h^2\,\delta_h^3 + 8\,k^5\,d_h^3\,\delta_h^3 +$$
$$696\,k^4\,q\,d_h^3\,\delta_h^3 + 9156\,k^3\,q^2\,d_h^3\,\delta_h^3 + 35\,856\,k^2\,q^3\,d_h^3\,\delta_h^3 + 52\,386\,k\,q^4\,d_h^3\,\delta_h^3 + 25\,410\,q^5\,d_h^3\,\delta_h^3 +$$
$$736\,k^4\,\eta\,d_h^3\,\delta_h^3 + 21\,096\,k^3\,q\,\eta\,d_h^3\,\delta_h^3 + 135\,036\,k^2\,q^2\,\eta\,d_h^3\,\delta_h^3 + 281\,256\,k\,q^3\,\eta\,d_h^3\,\delta_h^3 +$$
$$179\,436\,q^4\,\eta\,d_h^3\,\delta_h^3 + 11\,440\,k^3\,\eta^2\,d_h^3\,\delta_h^3 + 159\,652\,k^2\,q\,\eta^2\,d_h^3\,\delta_h^3 + 534\,256\,k\,q^2\,\eta^2\,d_h^3\,\delta_h^3 +$$
$$478\,492\,q^3\,\eta^2\,d_h^3\,\delta_h^3 + 58\,812\,k^2\,\eta^3\,d_h^3\,\delta_h^3 + 423\,016\,k\,q\,\eta^3\,d_h^3\,\delta_h^3 + 599\,452\,q^2\,\eta^3\,d_h^3\,\delta_h^3 +$$
$$115\,920\,k\,\eta^4\,d_h^3\,\delta_h^3 + 347\,760\,q\,\eta^4\,d_h^3\,\delta_h^3 + 72\,192\,\eta^5\,d_h^3\,\delta_h^3 + 200\,k^4\,d_h^4\,\delta_h^3 + 5970\,k^3\,q\,d_h^4\,\delta_h^3 +$$
$$38\,745\,k^2\,q^2\,d_h^4\,\delta_h^3 + 80\,770\,k\,q^3\,d_h^4\,\delta_h^3 + 51\,285\,q^4\,d_h^4\,\delta_h^3 + 6770\,k^3\,\eta\,d_h^4\,\delta_h^3 + 95\,400\,k^2\,q\,\eta\,d_h^4\,\delta_h^3 +$$
$$319\,800\,k\,q^2\,\eta\,d_h^4\,\delta_h^3 + 285\,910\,q^3\,\eta\,d_h^4\,\delta_h^3 + 55\,279\,k^2\,\eta^2\,d_h^4\,\delta_h^3 + 397\,662\,k\,q\,\eta^2\,d_h^4\,\delta_h^3 +$$
$$563\,499\,q^2\,\eta^2\,d_h^4\,\delta_h^3 + 154\,280\,k\,\eta^3\,d_h^4\,\delta_h^3 + 462\,840\,q\,\eta^3\,d_h^4\,\delta_h^3 + 131\,568\,\eta^4\,d_h^4\,\delta_h^3 + 1514\,k^3\,d_h^5\,\delta_h^3 +$$
$$21\,660\,k^2\,q\,d_h^5\,\delta_h^3 + 72\,828\,k\,q^2\,d_h^5\,\delta_h^3 + 64\,918\,q^3\,d_h^5\,\delta_h^3 + 26\,202\,k^2\,\eta\,d_h^5\,\delta_h^3 + 188\,976\,k\,q\,\eta\,d_h^5\,\delta_h^3 +$$
$$267\,582\,q^2\,\eta\,d_h^5\,\delta_h^3 + 115\,396\,k\,\eta^2\,d_h^5\,\delta_h^3 + 346\,188\,q\,\eta^2\,d_h^5\,\delta_h^3 + 139\,744\,\eta^3\,d_h^5\,\delta_h^3 + 4909\,k^2\,d_h^6\,\delta_h^3 +$$
$$35\,568\,k\,q\,d_h^6\,\delta_h^3 + 50\,295\,q^2\,d_h^6\,\delta_h^3 + 45\,386\,k\,\eta\,d_h^6\,\delta_h^3 + 136\,158\,q\,\eta\,d_h^6\,\delta_h^3 + 86\,696\,\eta^2\,d_h^6\,\delta_h^3 +$$
$$7266\,k\,d_h^7\,\delta_h^3 + 21\,798\,q\,d_h^7\,\delta_h^3 + 29\,064\,\eta\,d_h^7\,\delta_h^3 + 4047\,d_h^8\,\delta_h^3 + 48\,k^4\,q^3\,\gamma_h\,\delta_h^3 + 320\,k^3\,q^4\,\gamma_h\,\delta_h^3 +$$
$$681\,k^2\,q^5\,\gamma_h\,\delta_h^3 + 605\,k\,q^6\,\gamma_h\,\delta_h^3 + 192\,q^7\,\gamma_h\,\delta_h^3 + 160\,k^4\,q^2\,\eta\,\gamma_h\,\delta_h^3 + 1552\,k^3\,q^3\,\eta\,\gamma_h\,\delta_h^3 +$$
$$4504\,k^2\,q^4\,\eta\,\gamma_h\,\delta_h^3 + 5098\,k\,q^5\,\eta\,\gamma_h\,\delta_h^3 + 1980\,q^6\,\eta\,\gamma_h\,\delta_h^3 + 164\,k^4\,q\,\eta^2\,\gamma_h\,\delta_h^3 + 2660\,k^3\,q^2\,\eta^2\,\gamma_h\,\delta_h^3 +$$
$$11\,202\,k^2\,q^3\,\eta^2\,\gamma_h\,\delta_h^3 + 16\,830\,k\,q^4\,\eta^2\,\gamma_h\,\delta_h^3 + 8176\,q^5\,\eta^2\,\gamma_h\,\delta_h^3 + 48\,k^4\,\eta^3\,\gamma_h\,\delta_h^3 +$$
$$1856\,k^3\,q\,\eta^3\,\gamma_h\,\delta_h^3 + 12\,940\,k^2\,q^2\,\eta^3\,\gamma_h\,\delta_h^3 + 27\,628\,k\,q^3\,\eta^3\,\gamma_h\,\delta_h^3 + 17\,448\,q^4\,\eta^3\,\gamma_h\,\delta_h^3 +$$
$$416\,k^3\,\eta^4\,\gamma_h\,\delta_h^3 + 6724\,k^2\,q\,\eta^4\,\gamma_h\,\delta_h^3 + 23\,260\,k\,q^2\,\eta^4\,\gamma_h\,\delta_h^3 + 20\,400\,q^3\,\eta^4\,\gamma_h\,\delta_h^3 + 1152\,k^2\,\eta^5\,\gamma_h\,\delta_h^3 +$$
$$8992\,k\,q\,\eta^5\,\gamma_h\,\delta_h^3 + 12\,416\,q^2\,\eta^5\,\gamma_h\,\delta_h^3 + 1024\,k\,\eta^6\,\gamma_h\,\delta_h^3 + 3072\,q\,\eta^6\,\gamma_h\,\delta_h^3 + 160\,k^4\,q^2\,d_h\,\gamma_h\,\delta_h^3 +$$
$$1680\,k^3\,q^3\,d_h\,\gamma_h\,\delta_h^3 + 4920\,k^2\,q^4\,d_h\,\gamma_h\,\delta_h^3 + 5546\,k\,q^5\,d_h\,\gamma_h\,\delta_h^3 + 2140\,q^6\,d_h\,\gamma_h\,\delta_h^3 +$$
$$352\,k^4\,q\,\eta\,d_h\,\gamma_h\,\delta_h^3 + 5984\,k^3\,q^2\,\eta\,d_h\,\gamma_h\,\delta_h^3 + 25\,484\,k^2\,q^3\,\eta\,d_h\,\gamma_h\,\delta_h^3 + 38\,324\,k\,q^4\,\eta\,d_h\,\gamma_h\,\delta_h^3 +$$
$$18\,648\,q^5\,\eta\,d_h\,\gamma_h\,\delta_h^3 + 176\,k^4\,\eta^2\,d_h\,\gamma_h\,\delta_h^3 + 6656\,k^3\,q\,\eta^2\,d_h\,\gamma_h\,\delta_h^3 + 46\,396\,k^2\,q^2\,\eta^2\,d_h\,\gamma_h\,\delta_h^3 +$$
$$99\,276\,k\,q^3\,\eta^2\,d_h\,\gamma_h\,\delta_h^3 + 63\,216\,q^4\,\eta^2\,d_h\,\gamma_h\,\delta_h^3 + 2232\,k^3\,\eta^3\,d_h\,\gamma_h\,\delta_h^3 + 34\,652\,k^2\,q\,\eta^3\,d_h\,\gamma_h\,\delta_h^3 +$$
$$119\,348\,k\,q^2\,\eta^3\,d_h\,\gamma_h\,\delta_h^3 + 106\,072\,q^3\,\eta^3\,d_h\,\gamma_h\,\delta_h^3 + 8608\,k^2\,\eta^4\,d_h\,\gamma_h\,\delta_h^3 + 64\,880\,k\,q\,\eta^4\,d_h\,\gamma_h\,\delta_h^3 +$$
$$90\,976\,q^2\,\eta^4\,d_h\,\gamma_h\,\delta_h^3 + 11\,904\,k\,\eta^5\,d_h\,\gamma_h\,\delta_h^3 + 35\,712\,q\,\eta^5\,d_h\,\gamma_h\,\delta_h^3 + 4096\,\eta^6\,d_h\,\gamma_h\,\delta_h^3 +$$
$$176\,k^4\,q\,d_h^2\,\gamma_h\,\delta_h^3 + 3200\,k^3\,q^2\,d_h^2\,\gamma_h\,\delta_h^3 + 13\,814\,k^2\,q^3\,d_h^2\,\gamma_h\,\delta_h^3 + 20\,746\,k\,q^4\,d_h^2\,\gamma_h\,\delta_h^3 +$$
$$10\,044\,q^5\,d_h^2\,\gamma_h\,\delta_h^3 + 192\,k^4\,\eta\,d_h^2\,\gamma_h\,\delta_h^3 + 7472\,k^3\,q\,\eta\,d_h^2\,\gamma_h\,\delta_h^3 + 52\,532\,k^2\,q^2\,\eta\,d_h^2\,\gamma_h\,\delta_h^3 +$$
$$112\,616\,k\,q^3\,\eta\,d_h^2\,\gamma_h\,\delta_h^3 + 71\,832\,q^4\,\eta\,d_h^2\,\gamma_h\,\delta_h^3 + 4056\,k^3\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^3 + 62\,254\,k^2\,q\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^3 +$$
$$214\,274\,k\,q^2\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^3 + 191\,616\,q^3\,\eta^2\,d_h^2\,\gamma_h\,\delta_h^3 + 22\,552\,k^2\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^3 + 167\,520\,k\,q\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^3 +$$

$$236\,632\,q^2\,\eta^3\,d_h^2\,\gamma_h\,\delta_h^3 + 44\,064\,k\,\eta^4\,d_h^2\,\gamma_h\,\delta_h^3 + 132\,192\,q\,\eta^4\,d_h^2\,\gamma_h\,\delta_h^3 + 25\,088\,\eta^5\,d_h^2\,\gamma_h\,\delta_h^3 +$$
$$64\,k^4\,d_h^3\,\gamma_h\,\delta_h^3 + 2640\,k^3\,q\,d_h^3\,\gamma_h\,\delta_h^3 + 18\,844\,k^2\,q^2\,d_h^3\,\gamma_h\,\delta_h^3 + 40\,440\,k\,q^3\,d_h^3\,\gamma_h\,\delta_h^3 +$$
$$25\,704\,q^4\,d_h^3\,\gamma_h\,\delta_h^3 + 3040\,k^3\,\eta\,d_h^3\,\gamma_h\,\delta_h^3 + 46\,852\,k^2\,q\,\eta\,d_h^3\,\gamma_h\,\delta_h^3 + 161\,492\,k\,q^2\,\eta\,d_h^3\,\gamma_h\,\delta_h^3 +$$
$$144\,640\,q^3\,\eta\,d_h^3\,\gamma_h\,\delta_h^3 + 27\,144\,k^2\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^3 + 200\,552\,k\,q\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^3 + 284\,264\,q^2\,\eta^2\,d_h^3\,\gamma_h\,\delta_h^3 +$$
$$76\,480\,k\,\eta^3\,d_h^3\,\gamma_h\,\delta_h^3 + 229\,440\,q\,\eta^3\,d_h^3\,\gamma_h\,\delta_h^3 + 62\,592\,\eta^4\,d_h^3\,\gamma_h\,\delta_h^3 + 800\,k^3\,d_h^4\,\gamma_h\,\delta_h^3 +$$
$$12\,521\,k^2\,q\,d_h^4\,\gamma_h\,\delta_h^3 + 43\,277\,k\,q^2\,d_h^4\,\gamma_h\,\delta_h^3 + 38\,680\,q^3\,d_h^4\,\gamma_h\,\delta_h^3 + 15\,300\,k^2\,\eta\,d_h^4\,\gamma_h\,\delta_h^3 +$$
$$113\,038\,k\,q\,\eta\,d_h^4\,\gamma_h\,\delta_h^3 + 160\,380\,q^2\,\eta\,d_h^4\,\gamma_h\,\delta_h^3 + 68\,760\,k\,\eta^2\,d_h^4\,\gamma_h\,\delta_h^3 + 206\,280\,q\,\eta^2\,d_h^4\,\gamma_h\,\delta_h^3 +$$
$$81\,600\,\eta^3\,d_h^4\,\gamma_h\,\delta_h^3 + 3252\,k^2\,d_h^5\,\gamma_h\,\delta_h^3 + 24\,118\,k\,q\,d_h^5\,\gamma_h\,\delta_h^3 + 34\,188\,q^2\,d_h^5\,\gamma_h\,\delta_h^3 +$$
$$30\,936\,k\,\eta\,d_h^5\,\gamma_h\,\delta_h^3 + 92\,808\,q\,\eta\,d_h^5\,\gamma_h\,\delta_h^3 + 58\,592\,\eta^2\,d_h^5\,\gamma_h\,\delta_h^3 + 5476\,k\,d_h^6\,\gamma_h\,\delta_h^3 + 16\,428\,q\,d_h^6\,\gamma_h\,\delta_h^3 +$$
$$21\,904\,\eta\,d_h^6\,\gamma_h\,\delta_h^3 + 3312\,d_h^7\,\gamma_h\,\delta_h^3 + 50\,k^3\,q^3\,\gamma_h^2\,\delta_h^3 + 178\,k^2\,q^4\,\gamma_h^2\,\delta_h^3 + 208\,k\,q^5\,\gamma_h^2\,\delta_h^3 +$$
$$80\,q^6\,\gamma_h^2\,\delta_h^3 + 178\,k^3\,q^2\,\eta\,\gamma_h^2\,\delta_h^3 + 950\,k^2\,q^3\,\eta\,\gamma_h^2\,\delta_h^3 + 1488\,k\,q^4\,\eta\,\gamma_h^2\,\delta_h^3 + 720\,q^5\,\eta\,\gamma_h^2\,\delta_h^3 +$$
$$196\,k^3\,q\,\eta^2\,\gamma_h^2\,\delta_h^3 + 1752\,k^2\,q^2\,\eta^2\,\gamma_h^2\,\delta_h^3 + 3916\,k\,q^3\,\eta^2\,\gamma_h^2\,\delta_h^3 + 2460\,q^4\,\eta^2\,\gamma_h^2\,\delta_h^3 + 60\,k^3\,\eta^3\,\gamma_h^2\,\delta_h^3 +$$
$$1276\,k^2\,q\,\eta^3\,\gamma_h^2\,\delta_h^3 + 4628\,k\,q^2\,\eta^3\,\gamma_h^2\,\delta_h^3 + 4020\,q^3\,\eta^3\,\gamma_h^2\,\delta_h^3 + 280\,k^2\,\eta^4\,\gamma_h^2\,\delta_h^3 + 2320\,k\,q\,\eta^4\,\gamma_h^2\,\delta_h^3 +$$
$$3160\,q^2\,\eta^4\,\gamma_h^2\,\delta_h^3 + 320\,k\,\eta^5\,\gamma_h^2\,\delta_h^3 + 960\,q\,\eta^5\,\gamma_h^2\,\delta_h^3 + 178\,k^3\,q^2\,d_h\,\gamma_h^2\,\delta_h^3 + 950\,k^2\,q^3\,d_h\,\gamma_h^2\,\delta_h^3 +$$
$$1488\,k\,q^4\,d_h\,\gamma_h^2\,\delta_h^3 + 720\,q^5\,d_h\,\gamma_h^2\,\delta_h^3 + 416\,k^3\,q\,\eta\,d_h\,\gamma_h^2\,\delta_h^3 + 3688\,k^2\,q^2\,\eta\,d_h\,\gamma_h^2\,\delta_h^3 +$$
$$8288\,k\,q^3\,\eta\,d_h\,\gamma_h^2\,\delta_h^3 + 5280\,q^4\,\eta\,d_h\,\gamma_h^2\,\delta_h^3 + 220\,k^3\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^3 + 4380\,k^2\,q\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^3 +$$
$$15\,860\,k\,q^2\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^3 + 14\,100\,q^3\,\eta^2\,d_h\,\gamma_h^2\,\delta_h^3 + 1520\,k^2\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^3 + 12\,064\,k\,q\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^3 +$$
$$16\,880\,q^2\,\eta^3\,d_h\,\gamma_h^2\,\delta_h^3 + 2880\,k\,\eta^4\,d_h\,\gamma_h^2\,\delta_h^3 + 8640\,q\,\eta^4\,d_h\,\gamma_h^2\,\delta_h^3 + 1280\,\eta^5\,d_h\,\gamma_h^2\,\delta_h^3 +$$
$$208\,k^3\,q\,d_h^2\,\gamma_h^2\,\delta_h^3 + 1844\,k^2\,q^2\,d_h^2\,\gamma_h^2\,\delta_h^3 + 4144\,k\,q^3\,d_h^2\,\gamma_h^2\,\delta_h^3 + 2640\,q^4\,d_h^2\,\gamma_h^2\,\delta_h^3 + 240\,k^3\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^3 +$$
$$4656\,k^2\,q\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^3 + 16\,848\,k\,q^2\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^3 + 15\,120\,q^3\,\eta\,d_h^2\,\gamma_h^2\,\delta_h^3 + 2680\,k^2\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^3 +$$
$$20\,880\,k\,q\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^3 + 29\,560\,q^2\,\eta^2\,d_h^2\,\gamma_h^2\,\delta_h^3 + 7680\,k\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h^3 + 23\,040\,q\,\eta^3\,d_h^2\,\gamma_h^2\,\delta_h^3 +$$
$$5760\,\eta^4\,d_h^2\,\gamma_h^2\,\delta_h^3 + 80\,k^3\,d_h^3\,\gamma_h^2\,\delta_h^3 + 1552\,k^2\,q\,d_h^3\,\gamma_h^2\,\delta_h^3 + 5616\,k\,q^2\,d_h^3\,\gamma_h^2\,\delta_h^3 + 5040\,q^3\,d_h^3\,\gamma_h^2\,\delta_h^3 +$$
$$1920\,k^2\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^3 + 14\,848\,k\,q\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^3 + 21\,120\,q^2\,\eta\,d_h^3\,\gamma_h^2\,\delta_h^3 + 8960\,k\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h^3 +$$
$$26\,880\,q\,\eta^2\,d_h^3\,\gamma_h^2\,\delta_h^3 + 10\,240\,\eta^3\,d_h^3\,\gamma_h^2\,\delta_h^3 + 480\,k^2\,d_h^4\,\gamma_h^2\,\delta_h^3 + 3712\,k\,q\,d_h^4\,\gamma_h^2\,\delta_h^3 + 5280\,q^2\,d_h^4\,\gamma_h^2\,\delta_h^3 +$$
$$4800\,k\,\eta\,d_h^4\,\gamma_h^2\,\delta_h^3 + 14\,400\,q\,\eta\,d_h^4\,\gamma_h^2\,\delta_h^3 + 8960\,\eta^2\,d_h^4\,\gamma_h^2\,\delta_h^3 + 960\,k\,d_h^5\,\gamma_h^2\,\delta_h^3 + 2880\,q\,d_h^5\,\gamma_h^2\,\delta_h^3 +$$
$$3840\,\eta\,d_h^5\,\gamma_h^2\,\delta_h^3 + 640\,d_h^6\,\gamma_h^2\,\delta_h^3 + 16\,k^4\,q^3\,\delta_h^4 + 96\,k^3\,q^4\,\delta_h^4 + 189\,k^2\,q^5\,\delta_h^4 + 159\,k\,q^6\,\delta_h^4 +$$
$$48\,q^7\,\delta_h^4 + 48\,k^4\,q^2\,\eta\,\delta_h^4 + 448\,k^3\,q^3\,\eta\,\delta_h^4 + 1233\,k^2\,q^4\,\eta\,\delta_h^4 + 1332\,k\,q^5\,\eta\,\delta_h^4 + 495\,q^6\,\eta\,\delta_h^4 +$$
$$44\,k^4\,q\,\eta^2\,\delta_h^4 + 728\,k^3\,q^2\,\eta^2\,\delta_h^4 + 2998\,k^2\,q^3\,\eta^2\,\delta_h^4 + 4354\,k\,q^4\,\eta^2\,\delta_h^4 + 2044\,q^5\,\eta^2\,\delta_h^4 +$$
$$12\,k^4\,\eta^3\,\delta_h^4 + 480\,k^3\,q\,\eta^3\,\delta_h^4 + 3366\,k^2\,q^2\,\eta^3\,\delta_h^4 + 7060\,k\,q^3\,\eta^3\,\delta_h^4 + 4362\,q^4\,\eta^3\,\delta_h^4 + 104\,k^3\,\eta^4\,\delta_h^4 +$$
$$1700\,k^2\,q\,\eta^4\,\delta_h^4 + 5864\,k\,q^2\,\eta^4\,\delta_h^4 + 5100\,q^3\,\eta^4\,\delta_h^4 + 288\,k^2\,\eta^5\,\delta_h^4 + 2240\,k\,q\,\eta^5\,\delta_h^4 +$$
$$3104\,q^2\,\eta^5\,\delta_h^4 + 256\,k\,\eta^6\,\delta_h^4 + 768\,q\,\eta^6\,\delta_h^4 + 48\,k^4\,q^2\,d_h\,\delta_h^4 + 488\,k^3\,q^3\,d_h\,\delta_h^4 + 1353\,k^2\,q^4\,d_h\,\delta_h^4 +$$
$$1452\,k\,q^5\,d_h\,\delta_h^4 + 535\,q^6\,d_h\,\delta_h^4 + 96\,k^4\,q\,\eta\,d_h\,\delta_h^4 + 1656\,k^3\,q^2\,\eta\,d_h\,\delta_h^4 + 6876\,k^2\,q^3\,\eta\,d_h\,\delta_h^4 +$$
$$9966\,k\,q^4\,\eta\,d_h\,\delta_h^4 + 4662\,q^5\,\eta\,d_h\,\delta_h^4 + 44\,k^4\,\eta^2\,d_h\,\delta_h^4 + 1742\,k^3\,q\,\eta^2\,d_h\,\delta_h^4 + 12\,188\,k^2\,q^2\,\eta^2\,d_h\,\delta_h^4 +$$
$$25\,542\,k\,q^3\,\eta^2\,d_h\,\delta_h^4 + 15\,804\,q^4\,\eta^2\,d_h\,\delta_h^4 + 558\,k^3\,\eta^3\,d_h\,\delta_h^4 + 8842\,k^2\,q\,\eta^3\,d_h\,\delta_h^4 + 30\,322\,k\,q^2\,\eta^3\,d_h\,\delta_h^4 +$$
$$26\,518\,q^3\,\eta^3\,d_h\,\delta_h^4 + 2152\,k^2\,\eta^4\,d_h\,\delta_h^4 + 16\,288\,k\,q\,\eta^4\,d_h\,\delta_h^4 + 22\,744\,q^2\,\eta^4\,d_h\,\delta_h^4 + 2976\,k\,\eta^5\,d_h\,\delta_h^4 +$$
$$8928\,q\,\eta^5\,d_h\,\delta_h^4 + 1024\,\eta^6\,d_h\,\delta_h^4 + 48\,k^4\,q\,d_h^2\,\delta_h^4 + 888\,k^3\,q^2\,d_h^2\,\delta_h^4 + 3738\,k^2\,q^3\,d_h^2\,\delta_h^4 +$$
$$5403\,k\,q^4\,d_h^2\,\delta_h^4 + 2511\,q^5\,d_h^2\,\delta_h^4 + 48\,k^4\,\eta\,d_h^2\,\delta_h^4 + 1968\,k^3\,q\,\eta\,d_h^2\,\delta_h^4 + 13\,878\,k^2\,q^2\,\eta\,d_h^2\,\delta_h^4 +$$
$$29\,088\,k\,q^3\,\eta\,d_h^2\,\delta_h^4 + 17\,958\,q^4\,\eta\,d_h^2\,\delta_h^4 + 1014\,k^3\,\eta^2\,d_h^2\,\delta_h^4 + 15\,976\,k^2\,q\,\eta^2\,d_h^2\,\delta_h^4 +$$
$$54\,706\,k\,q^2\,\eta^2\,d_h^2\,\delta_h^4 + 47\,904\,q^3\,\eta^2\,d_h^2\,\delta_h^4 + 5638\,k^2\,\eta^3\,d_h^2\,\delta_h^4 + 42\,244\,k\,q\,\eta^3\,d_h^2\,\delta_h^4 +$$
$$59\,158\,q^2\,\eta^3\,d_h^2\,\delta_h^4 + 11\,016\,k\,\eta^4\,d_h^2\,\delta_h^4 + 33\,048\,q\,\eta^4\,d_h^2\,\delta_h^4 + 6272\,\eta^5\,d_h^2\,\delta_h^4 + 16\,k^4\,d_h^3\,\delta_h^4 +$$
$$696\,k^3\,q\,d_h^3\,\delta_h^4 + 4986\,k^2\,q^2\,d_h^3\,\delta_h^4 + 10\,456\,k\,q^3\,d_h^3\,\delta_h^4 + 6426\,q^4\,d_h^3\,\delta_h^4 + 760\,k^3\,\eta\,d_h^3\,\delta_h^4 +$$
$$12\,060\,k^2\,q\,\eta\,d_h^3\,\delta_h^4 + 41\,340\,k\,q^2\,\eta\,d_h^3\,\delta_h^4 + 36\,160\,q^3\,\eta\,d_h^3\,\delta_h^4 + 6786\,k^2\,\eta^2\,d_h^3\,\delta_h^4 + 50\,708\,k\,q\,\eta^2\,d_h^3\,\delta_h^4 +$$
$$71\,066\,q^2\,\eta^2\,d_h^3\,\delta_h^4 + 19\,120\,k\,\eta^3\,d_h^3\,\delta_h^4 + 57\,360\,q\,\eta^3\,d_h^3\,\delta_h^4 + 15\,648\,\eta^4\,d_h^3\,\delta_h^4 + 200\,k^3\,d_h^4\,\delta_h^4 +$$

$$3225\,k^2 q d_h^4 \delta_h^4 + 11\,085\,k q^2 d_h^4 \delta_h^4 + 9670\,q^3 d_h^4 \delta_h^4 + 3825\,k^2 \eta d_h^4 \delta_h^4 + 28\,620\,k q \eta d_h^4 \delta_h^4 +$$
$$40\,095\,q^2 \eta d_h^4 \delta_h^4 + 17\,190\,k \eta^2 d_h^4 \delta_h^4 + 51\,570\,q \eta^2 d_h^4 \delta_h^4 + 20\,400\,\eta^3 d_h^4 \delta_h^4 + 813\,k^2 d_h^5 \delta_h^4 +$$
$$6108\,k q d_h^5 \delta_h^4 + 8547\,q^2 d_h^5 \delta_h^4 + 7734\,k \eta d_h^5 \delta_h^4 + 23\,202\,q \eta d_h^5 \delta_h^4 + 14\,648\,\eta^2 d_h^5 \delta_h^4 +$$
$$1369\,k d_h^6 \delta_h^4 + 4107\,q d_h^6 \delta_h^4 + 5476\,\eta d_h^6 \delta_h^4 + 828\,d_h^7 \delta_h^4 + 32\,k^3 q^3 \gamma_h \delta_h^4 + 104\,k^2 q^4 \gamma_h \delta_h^4 +$$
$$112\,k q^5 \gamma_h \delta_h^4 + 40\,q^6 \gamma_h \delta_h^4 + 104\,k^3 q^2 \eta \gamma_h \delta_h^4 + 536\,k^2 q^3 \eta \gamma_h \delta_h^4 + 792\,k q^4 \eta \gamma_h \delta_h^4 +$$
$$360\,q^5 \eta \gamma_h \delta_h^4 + 104\,k^3 q \eta^2 \gamma_h \delta_h^4 + 942\,k^2 q^2 \eta^2 \gamma_h \delta_h^4 + 2044\,k q^3 \eta^2 \gamma_h \delta_h^4 + 1230\,q^4 \eta^2 \gamma_h \delta_h^4 +$$
$$30\,k^3 \eta^3 \gamma_h \delta_h^4 + 654\,k^2 q \eta^3 \gamma_h \delta_h^4 + 2362\,k q^2 \eta^3 \gamma_h \delta_h^4 + 2010\,q^3 \eta^3 \gamma_h \delta_h^4 + 140\,k^2 \eta^4 \gamma_h \delta_h^4 +$$
$$1160\,k q \eta^4 \gamma_h \delta_h^4 + 1580\,q^2 \eta^4 \gamma_h \delta_h^4 + 160\,k \eta^5 \gamma_h \delta_h^4 + 480\,q \eta^5 \gamma_h \delta_h^4 + 104\,k^3 q^2 d_h \gamma_h \delta_h^4 +$$
$$536\,k^2 q^3 d_h \gamma_h \delta_h^4 + 792\,k q^4 d_h \gamma_h \delta_h^4 + 360\,q^5 d_h \gamma_h \delta_h^4 + 224\,k^3 q \eta d_h \gamma_h \delta_h^4 + 2000\,k^2 q^2 \eta d_h \gamma_h \delta_h^4 +$$
$$4352\,k q^3 \eta d_h \gamma_h \delta_h^4 + 2640\,q^4 \eta d_h \gamma_h \delta_h^4 + 110\,k^3 \eta^2 d_h \gamma_h \delta_h^4 + 2270\,k^2 q \eta^2 d_h \gamma_h \delta_h^4 +$$
$$8170\,k q^2 \eta^2 d_h \gamma_h \delta_h^4 + 7050\,q^3 \eta^2 d_h \gamma_h \delta_h^4 + 760\,k^2 \eta^3 d_h \gamma_h \delta_h^4 + 6096\,k q \eta^3 d_h \gamma_h \delta_h^4 +$$
$$8440\,q^2 \eta^3 d_h \gamma_h \delta_h^4 + 1440\,k \eta^4 d_h \gamma_h \delta_h^4 + 4320\,q \eta^4 d_h \gamma_h \delta_h^4 + 640\,\eta^5 d_h \gamma_h \delta_h^4 + 112\,k^3 q d_h^2 \gamma_h \delta_h^4 +$$
$$1000\,k^2 q^2 d_h^2 \gamma_h \delta_h^4 + 2176\,k q^3 d_h^2 \gamma_h \delta_h^4 + 1320\,q^4 d_h^2 \gamma_h \delta_h^4 + 120\,k^3 \eta d_h^2 \gamma_h \delta_h^4 +$$
$$2424\,k^2 q \eta d_h^2 \gamma_h \delta_h^4 + 8712\,k q^2 \eta d_h^2 \gamma_h \delta_h^4 + 7560\,q^3 \eta d_h^2 \gamma_h \delta_h^4 + 1340\,k^2 \eta^2 d_h^2 \gamma_h \delta_h^4 +$$
$$10\,600\,k q \eta^2 d_h^2 \gamma_h \delta_h^4 + 14\,780\,q^2 \eta^2 d_h^2 \gamma_h \delta_h^4 + 3840\,k \eta^3 d_h^2 \gamma_h \delta_h^4 + 11\,520\,q \eta^3 d_h^2 \gamma_h \delta_h^4 +$$
$$2880\,\eta^4 d_h^2 \gamma_h \delta_h^4 + 40\,k^3 d_h^3 \gamma_h \delta_h^4 + 808\,k^2 q d_h^3 \gamma_h \delta_h^4 + 2904\,k q^2 d_h^3 \gamma_h \delta_h^4 + 2520\,q^3 d_h^3 \gamma_h \delta_h^4 +$$
$$960\,k^2 \eta d_h^3 \gamma_h \delta_h^4 + 7552\,k q \eta d_h^3 \gamma_h \delta_h^4 + 10\,560\,q^2 \eta d_h^3 \gamma_h \delta_h^4 + 4480\,k \eta^2 d_h^3 \gamma_h \delta_h^4 +$$
$$13\,440\,q \eta^2 d_h^3 \gamma_h \delta_h^4 + 5120\,\eta^3 d_h^3 \gamma_h \delta_h^4 + 240\,k^2 d_h^4 \gamma_h \delta_h^4 + 1888\,k q d_h^4 \gamma_h \delta_h^4 + 2640\,q^2 d_h^4 \gamma_h \delta_h^4 +$$
$$2400\,k \eta d_h^4 \gamma_h \delta_h^4 + 7200\,q \eta d_h^4 \gamma_h \delta_h^4 + 4480\,\eta^2 d_h^4 \gamma_h \delta_h^4 + 480\,k d_h^5 \gamma_h \delta_h^4 + 1440\,q d_h^5 \gamma_h \delta_h^4 +$$
$$1920\,\eta d_h^5 \gamma_h \delta_h^4 + 320\,d_h^6 \gamma_h \delta_h^4 + 8\,k^3 q^3 \delta_h^5 + 24\,k^2 q^4 \delta_h^5 + 24\,k q^5 \delta_h^5 + 8\,q^6 \delta_h^5 + 24\,k^3 q^2 \eta \delta_h^5 +$$
$$120\,k^2 q^3 \eta \delta_h^5 + 168\,k q^4 \eta \delta_h^5 + 72\,q^5 \eta \delta_h^5 + 22\,k^3 q \eta^2 \delta_h^5 + 202\,k^2 q^2 \eta^2 \delta_h^5 + 426\,k q^3 \eta^2 \delta_h^5 +$$
$$246\,q^4 \eta^2 \delta_h^5 + 6\,k^3 \eta^3 \delta_h^5 + 134\,k^2 q \eta^3 \delta_h^5 + 482\,k q^2 \eta^3 \delta_h^5 + 402\,q^3 \eta^3 \delta_h^5 + 28\,k^2 \eta^4 \delta_h^5 +$$
$$232\,k q \eta^4 \delta_h^5 + 316\,q^2 \eta^4 \delta_h^5 + 32\,k \eta^5 \delta_h^5 + 96\,q \eta^5 \delta_h^5 + 24\,k^3 q^2 d_h \delta_h^5 + 120\,k^2 q^3 d_h \delta_h^5 +$$
$$168\,k q^4 d_h \delta_h^5 + 72\,q^5 d_h \delta_h^5 + 48\,k^3 q \eta d_h \delta_h^5 + 432\,k^2 q^2 \eta d_h \delta_h^5 + 912\,k q^3 \eta d_h \delta_h^5 +$$
$$528\,q^4 \eta d_h \delta_h^5 + 22\,k^3 \eta^2 d_h \delta_h^5 + 470\,k^2 q \eta^2 d_h \delta_h^5 + 1682\,k q^2 \eta^2 d_h \delta_h^5 + 1410\,q^3 \eta^2 d_h \delta_h^5 +$$
$$152\,k^2 \eta^3 d_h \delta_h^5 + 1232\,k q \eta^3 d_h \delta_h^5 + 1688\,q^2 \eta^3 d_h \delta_h^5 + 288\,k \eta^4 d_h \delta_h^5 + 864\,q \eta^4 d_h \delta_h^5 +$$
$$128\,\eta^5 d_h \delta_h^5 + 24\,k^3 q d_h^2 \delta_h^5 + 216\,k^2 q^2 d_h^2 \delta_h^5 + 456\,k q^3 d_h^2 \delta_h^5 + 264\,q^4 d_h^2 \delta_h^5 + 24\,k^3 \eta d_h^2 \delta_h^5 +$$
$$504\,k^2 q \eta d_h^2 \delta_h^5 + 1800\,k q^2 \eta d_h^2 \delta_h^5 + 1512\,q^3 \eta d_h^2 \delta_h^5 + 268\,k^2 \eta^2 d_h^2 \delta_h^5 + 2152\,k q \eta^2 d_h^2 \delta_h^5 +$$
$$2956\,q^2 \eta^2 d_h^2 \delta_h^5 + 768\,k \eta^3 d_h^2 \delta_h^5 + 2304\,q \eta^3 d_h^2 \delta_h^5 + 576\,\eta^4 d_h^2 \delta_h^5 + 8\,k^3 d_h^3 \delta_h^5 + 168\,k^2 q d_h^3 \delta_h^5 +$$
$$600\,k q^2 d_h^3 \delta_h^5 + 504\,q^3 d_h^3 \delta_h^5 + 192\,k^2 \eta d_h^3 \delta_h^5 + 1536\,k q \eta d_h^3 \delta_h^5 + 2112\,q^2 \eta d_h^3 \delta_h^5 +$$
$$896\,k \eta^2 d_h^3 \delta_h^5 + 2688\,q \eta^2 d_h^3 \delta_h^5 + 1024\,\eta^3 d_h^3 \delta_h^5 + 48\,k^2 d_h^4 \delta_h^5 + 384\,k q d_h^4 \delta_h^5 + 528\,q^2 d_h^4 \delta_h^5 +$$
$$480\,k \eta d_h^4 \delta_h^5 + 1440\,q \eta d_h^4 \delta_h^5 + 896\,\eta^2 d_h^4 \delta_h^5 + 96\,k d_h^5 \delta_h^5 + 288\,q d_h^5 \delta_h^5 + 384\,\eta d_h^5 \delta_h^5 + 64\,d_h^6 \delta_h^5$$

The reduced equation in this case has

$$C_0\ ((\lambda_h)^*)^2 + C_1\ ((\lambda_h)^*) + C_2\ = 0$$

$$x^* = P / (K_1 + K_2\ (\lambda_h)^*),\ z = Q_3 + Q_4\ (\lambda_h)^* / ((K_1 + K_2\ (\lambda_h)^*)),\ y^* = Q_1 + Q_2\ (\lambda_h)^* / ((K_1 + K_2\ (\lambda_h)^*))$$

In[22]:=
$$(\lambda_h)^* = \psi$$
$$N_{hH}{}^* = P / (K_1 + K_2\ \psi) + (Q_2\ \psi / (K_1 + K_2\ \psi)) + (Q_3 + Q_4\ (\lambda_h)^*) / (K_1 + K_2\ \psi)$$

In[24]:=
$$\text{Simplify}\left[\frac{P}{K_1+\psi K_2}+\frac{\psi Q_2}{K_1+\psi K_2}+\frac{Q_3+\psi Q_4}{K_1+\psi K_2}\right]$$

Out[24]=
$$\frac{P+\psi Q_2+Q_3+\psi Q_4}{K_1+\psi K_2}$$

$$(\lambda_v)^* = \psi_1$$

In[25]:=
$$\psi_1 = \beta_v\left(\frac{\psi Q_2}{K_1+\psi K_2}\right)\Big/\left(\frac{P+\psi Q_2+Q_3+\psi Q_4}{K_1+\psi K_2}\right)$$

Out[25]=
$$\frac{\psi Q_2\,\beta_v}{P+\psi Q_2+Q_3+\psi Q_4}$$

In[1]:=
$$\text{Solve}[\{\lambda_v^* * (\phi - d_v m^*) - d_v * d_v * m^* == 0\}, \{m^*\}]$$

Out[1]=
$$\left\{\left\{m^* \to \frac{\phi\ (\lambda_v)^*}{d_v\ (d_v + (\lambda_v)^*)}\right\}\right\}$$

In[2]:=
$$\text{Simplify}\left[\frac{\phi}{d_v\left(d_v+\frac{\psi Q_2\,\beta_v}{P+\psi Q_2+Q_3+\psi Q_4}\right)}\ \frac{\psi Q_2\,\beta_v}{P+\psi Q_2+Q_3+\psi Q_4}\right]$$

In[3]:=
$$m^* = \frac{\phi\,\psi\,Q_2\,\beta_v}{d_v\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)+\psi Q_2\,\beta_v)}$$

Out[3]=
$$\frac{\phi\,\psi\,Q_2\,\beta_v}{d_v\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)+\psi Q_2\,\beta_v)}$$

In[4]:=
$$\beta_h\,\frac{\phi\,\psi\,Q_2\,\beta_v}{d_v\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)+\psi Q_2\,\beta_v)}\Big/\left(\frac{P+\psi Q_2+Q_3+\psi Q_4}{K_1+\psi K_2}\right)$$

Out[4]=
$$(\phi\,\psi\ (K_1+\psi K_2)\ Q_2\,\beta_h\,\beta_v)\ /\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)+\psi Q_2\,\beta_v))$$

In[2]:=
$$\text{Expand}[\psi\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)\ (d_v\ (P+\psi Q_2+Q_3+\psi Q_4)+\psi Q_2\,\beta_v))-\phi\,\psi\ (K_1+\psi K_2)\ Q_2\,\beta_h\,\beta_v]$$

Out[2]=
$$P^2\,\psi\,d_v^2 + 2\,P\,\psi^2\,d_v^2\,Q_2 + \psi^3\,d_v^2\,Q_2^2 + 2\,P\,\psi\,d_v^2\,Q_3 + 2\,\psi^2\,d_v^2\,Q_2\,Q_3 + \psi\,d_v^2\,Q_3^2 + 2\,P\,\psi^2\,d_v^2\,Q_4 + 2\,\psi^3\,d_v^2\,Q_2\,Q_4 + 2\,\psi^2\,d_v^2\,Q_3\,Q_4 + \psi^3\,d_v^2\,Q_4^2 + P\,\psi^2\,d_v\,Q_2\,\beta_v + \psi^3\,d_v\,Q_2^2\,\beta_v + \psi^2\,d_v\,Q_2\,Q_3\,\beta_v + \psi^3\,d_v\,Q_2\,Q_4\,\beta_v - \phi\,\psi\,K_1\,Q_2\,\beta_h\,\beta_v - \phi\,\psi^2\,K_2\,Q_2\,\beta_h\,\beta_v$$

In[3]:=
$$\text{poly2} = P^2\,\psi\,d_v^2 + 2\,P\,\psi^2\,d_v^2\,Q_2 + \psi^3\,d_v^2\,Q_2^2 + 2\,P\,\psi\,d_v^2\,Q_3 + 2\,\psi^2\,d_v^2\,Q_2\,Q_3 + \psi\,d_v^2\,Q_3^2 + 2\,P\,\psi^2\,d_v^2\,Q_4 + 2\,\psi^3\,d_v^2\,Q_2\,Q_4 + 2\,\psi^2\,d_v^2\,Q_3\,Q_4 + \psi^3\,d_v^2\,Q_4^2 + P\,\psi^2\,d_v\,Q_2\,\beta_v + \psi^3\,d_v\,Q_2^2\,\beta_v + \psi^2\,d_v\,Q_2\,Q_3\,\beta_v + \psi^3\,d_v\,Q_2\,Q_4\,\beta_v - \phi\,\psi\,K_1\,Q_2\,\beta_h\,\beta_v - \phi\,\psi^2\,K_2\,Q_2\,\beta_h\,\beta_v$$

Out[3]=
$$P^2\,\psi\,d_v^2 + 2\,P\,\psi^2\,d_v^2\,Q_2 + \psi^3\,d_v^2\,Q_2^2 + 2\,P\,\psi\,d_v^2\,Q_3 + 2\,\psi^2\,d_v^2\,Q_2\,Q_3 + \psi\,d_v^2\,Q_3^2 + 2\,P\,\psi^2\,d_v^2\,Q_4 + 2\,\psi^3\,d_v^2\,Q_2\,Q_4 + 2\,\psi^2\,d_v^2\,Q_3\,Q_4 + \psi^3\,d_v^2\,Q_4^2 + P\,\psi^2\,d_v\,Q_2\,\beta_v + \psi^3\,d_v\,Q_2^2\,\beta_v + \psi^2\,d_v\,Q_2\,Q_3\,\beta_v + \psi^3\,d_v\,Q_2\,Q_4\,\beta_v - \phi\,\psi\,K_1\,Q_2\,\beta_h\,\beta_v - \phi\,\psi^2\,K_2\,Q_2\,\beta_h\,\beta_v$$

In[12]:=
$$\text{Coefficient}[\text{poly2}, \psi, 0]$$

Out[12]=
$$0$$

In[13]:=
$$\text{Coefficient}[\text{poly2}, \psi, 1]$$

$$P^2\,d_v^2 + 2\,P\,d_v^2\,Q_3 + d_v^2\,Q_3^2 - \phi\,K_1\,Q_2\,\beta_h\,\beta_v = (P+Q_3)^2\,d_v^2 - \phi\,K_1\,Q_2\,\beta_h\,\beta_v$$

In[4]:= **Coefficient[poly2, ψ, 2]**

Out[4]= $2\,P\,d_v^2\,Q_2 + 2\,d_v^2\,Q_2\,Q_3 + 2\,P\,d_v^2\,Q_4 + 2\,d_v^2\,Q_3\,Q_4 + P\,d_v\,Q_2\,\beta_v + d_v\,Q_2\,Q_3\,\beta_v - \phi\,K_2\,Q_2\,\beta_h\,\beta_v$

In[5]:= **Coefficient[poly2, ψ, 3]**

Out[5]= $d_v^2\,Q_2^2 + 2\,d_v^2\,Q_2\,Q_4 + d_v^2\,Q_4^2 + d_v\,Q_2^2\,\beta_v + d_v\,Q_2\,Q_4\,\beta_v$

$$R_2 = \sqrt{\frac{\phi\beta_h\,\beta_v\,P\,K_1}{(d_h + \gamma_h + \delta_h)\,(P + Q_3)^2\,d_v^2}}$$