In[31]:=
```
NSolve[r1 * cAMP * ((W0 - AC_pt) / (Km1 + cAMP + (W0 - AC_pt))) -
    r2 * D_t * (AC_pt / (Km2 + D_t + AC_pt)) == 0, AC_pt, Reals]
```

Out[31]=
$$\left\{\left\{\text{AC\_pt} \to \frac{0.5\ (-1.\ \text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\ \text{cAMP r1 D\_t} - 1.\ \text{cAMP r2 D\_t} - 1.\ \text{Km1 r2 D\_t} - 1.\ \text{r2}}{\text{cAMP r1} - 1.\ \text{r2 D\_t}}\right.\right.$$
$$- 0.5 \sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{Km2}^2\ \text{r1}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{W0} + \text{cAMP}^2\ \text{r1}^2\ \text{W0}^2 + 2.\right.\right.$$
$$\text{Km2 r1}^2\ \text{D\_t} + 2.\ \text{cAMP}^2\ \text{Km2 r1 r2 D\_t} + 2.\ \text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\ \text{cAMP}^2\ \text{r1}^2\ \text{W0}$$
$$2.\ \text{cAMP}^2\ \text{r1 r2 W0 D\_t} - 2.\ \text{cAMP Km1 r1 r2 W0 D\_t} - 2.\ \text{cAMP Km2 r1 r2 W0 D\_t} -$$
$$2.\ \text{cAMP r1 r2 W0}^2\ \text{D\_t} + \text{cAMP}^2\ \text{r1}^2\ \text{D\_t}^2 + 2.\ \text{cAMP}^2\ \text{r1 r2 D\_t}^2 + 2.\ \text{cAMP Km1 r1 r2 D\_}$$
$$\text{cAMP}^2\ \text{r2}^2\ \text{D\_t}^2 + 2.\ \text{cAMP Km1 r2}^2\ \text{D\_t}^2 + \text{Km1}^2\ \text{r2}^2\ \text{D\_t}^2 - 2.\ \text{cAMP r1 r2 W0 D\_t}^2 +$$
$$\left.\left.\left.2.\ \text{cAMP r2}^2\ \text{W0 D\_t}^2 + 2.\ \text{Km1 r2}^2\ \text{W0 D\_t}^2 + \text{r2}^2\ \text{W0}^2\ \text{D\_t}^2\right)\right)\right\}\right\}$$ if *condition* +

In[32]:=
```
{{AC_pt → (0.5` (-1.` cAMP Km2 r1 + cAMP r1 W0 - 1.` cAMP r1 D_t -
        1.` cAMP r2 D_t - 1.` Km1 r2 D_t - 1.` r2 W0 D_t)) / (cAMP r1 - 1.` r2 D_t) -
  0.5` √((cAMP^2 Km2^2 r1^2 + 2.` cAMP^2 Km2 r1^2 W0 + cAMP^2 r1^2 W0^2 + 2.` cAMP^2 Km2 r1^2 D_t +
       2.` cAMP^2 Km2 r1 r2 D_t + 2.` cAMP Km1 Km2 r1 r2 D_t + 2.` cAMP^2 r1^2 W0 D_t -
       2.` cAMP^2 r1 r2 W0 D_t - 2.` cAMP Km1 r1 r2 W0 D_t - 2.` cAMP Km2 r1 r2 W0 D_t -
       2.` cAMP r1 r2 W0^2 D_t + cAMP^2 r1^2 D_t^2 + 2.` cAMP^2 r1 r2 D_t^2 + 2.` cAMP Km1 r1 r
       cAMP^2 r2^2 D_t^2 + 2.` cAMP Km1 r2^2 D_t^2 + Km1^2 r2^2 D_t^2 - 2.` cAMP r1 r2 W0 D_t^2 +
       2.` cAMP r2^2 W0 D_t^2 + 2.` Km1 r2^2 W0 D_t^2 + r2^2 W0^2 D_t^2) / (cAMP r1 - 1.` r2 D_
 if (cAMP > 0 && r1 > 0 && D_t < 0 && r2 < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (cAMP > 0 && r2 > 0 && D_t < 0 &&
   r1 < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (Km1 > -1.` cAMP && cAMP > 0 && r1 > 0 && r2 > 0 && D_t < 0 && Km2 < -1.` D_t) ||
 (Km1 > -1.` cAMP && cAMP > 0 && D_t < 0 && r2 < 0 && r1 < 0 && Km2 < -1.` D_t) ||
 (Km1 > -1.` cAMP && Km2 > -1.` D_t && cAMP > 0 && r1 > 0 && D_t < 0 && r2 < 0) ||
 (Km1 > -1.` cAMP && Km2 > -1.` D_t && cAMP > 0 && r2 > 0 && D_t < 0 && r1 < 0) ||
 (Km1 > -1.` cAMP && Km2 > -1.` D_t && r1 > 0 && r2 > 0 && D_t < 0 && cAMP < 0) ||
 (Km1 > -1.` cAMP && Km2 > -1.` D_t && D_t < 0 && r2 < 0 && r1 < 0 && cAMP < 0) ||
 (Km1 > -1.` cAMP && r1 > 0 && D_t < 0 && r2 < 0 && cAMP < 0 && Km2 < -1.` D_t) ||
 (Km1 > -1.` cAMP && r2 > 0 && D_t < 0 && r1 < 0 && cAMP < 0 && Km2 < -1.` D_t) ||
 (Km2 > -1.` D_t && cAMP > 0 && r1 > 0 && r2 > 0 && D_t < 0 && Km1 < -1.` cAMP) ||
 (Km2 > -1.` D_t && cAMP > 0 && D_t < 0 && r2 < 0 && r1 < 0 && Km1 < -1.` cAMP) ||
 (Km2 > -1.` D_t && r1 > 0 && D_t < 0 && r2 < 0 && cAMP < 0 && Km1 < -1.` cAMP) ||
 (Km2 > -1.` D_t && r2 > 0 && D_t < 0 && r1 < 0 && cAMP < 0 && Km1 < -1.` cAMP) ||
 (r1 > 0 && r2 > 0 && D_t < 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && cAMP > 0 && r1 > 0 && r2 > 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && cAMP > 0 && r2 < 0 && r1 < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && Km1 > -1.` cAMP && cAMP > 0 && r1 > 0 && r2 < 0 && Km2 < -1.` D_t) ||
 (D_t > 0 && Km1 > -1.` cAMP && cAMP > 0 && r2 > 0 && r1 < 0 && Km2 < -1.` D_t) ||
 (D_t > 0 && Km1 > -1.` cAMP && Km2 > -1.` D_t && cAMP > 0 && r1 > 0 && r2 > 0) ||
 (D_t > 0 && Km1 > -1.` cAMP && Km2 > -1.` D_t && cAMP > 0 && r2 < 0 && r1 < 0) ||
 (D_t > 0 && Km1 > -1.` cAMP && Km2 > -1.` D_t && r1 > 0 && r2 < 0 && cAMP < 0) ||
 (D_t > 0 && Km1 > -1.` cAMP && Km2 > -1.` D_t && r2 > 0 && r1 < 0 && cAMP < 0) ||
 (D_t > 0 && Km1 > -1.` cAMP && r1 > 0 && r2 > 0 && cAMP < 0 && Km2 < -1.` D_t) ||
```

$$
\begin{aligned}
&(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& r2 < 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` D\_t) \;||\\
&(D\_t > 0 \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 < 0 \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t > 0 \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& r2 > 0 \&\& r1 < 0 \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t > 0 \&\& Km2 > -1.` D\_t \&\& r1 > 0 \&\& r2 > 0 \&\& cAMP < 0 \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t > 0 \&\& Km2 > -1.` D\_t \&\& r2 < 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t > 0 \&\& r1 > 0 \&\& r2 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t > 0 \&\& r2 > 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP) \;||\\
&(D\_t < 0 \&\& r2 < 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP) \;||\\
&\Bigg(cAMP > 0 \&\& r1 > 0 \&\& r2 > 0 \&\& D\_t < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP \&\&\\
&\quad W0 < \frac{-1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t}{cAMP\, r1 - 1.` r2\, D\_t} -\\
&\qquad 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\, Km2\, r1\, r2\, D\_t + cAMP\, Km1\, Km2\, r1\, r2\, D\_t + cAMP^2\, r1\, r2\, D\_t^2 +\right.\right.\right.\right.\\
&\qquad\qquad \left.\left.\left.\left. cAMP\, Km1\, r1\, r2\, D\_t^2\right)\right) \Big/ (cAMP\, r1 - 1.` r2\, D\_t)^2\right)\right)\Bigg) \;||\\
&\Bigg(cAMP > 0 \&\& D\_t < 0 \&\& r2 < 0 \&\& r1 < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP \&\&\\
&\quad W0 < \frac{-1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t}{cAMP\, r1 - 1.` r2\, D\_t} -\\
&\qquad 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\, Km2\, r1\, r2\, D\_t + cAMP\, Km1\, Km2\, r1\, r2\, D\_t + cAMP^2\, r1\, r2\, D\_t^2 +\right.\right.\right.\right.\\
&\qquad\qquad \left.\left.\left.\left. cAMP\, Km1\, r1\, r2\, D\_t^2\right)\right) \Big/ (cAMP\, r1 - 1.` r2\, D\_t)^2\right)\right)\Bigg) \;||\\
&\Bigg(Km1 > -1.` cAMP \&\& cAMP > 0 \&\& r1 > 0 \&\& D\_t < 0 \&\& r2 < 0 \&\& Km2 < -1.` D\_t \&\&\\
&\quad W0 < \frac{-1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t}{cAMP\, r1 - 1.` r2\, D\_t} -\\
&\qquad 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\, Km2\, r1\, r2\, D\_t + cAMP\, Km1\, Km2\, r1\, r2\, D\_t + cAMP^2\, r1\, r2\, D\_t^2 +\right.\right.\right.\right.\\
&\qquad\qquad \left.\left.\left.\left. cAMP\, Km1\, r1\, r2\, D\_t^2\right)\right) \Big/ (cAMP\, r1 - 1.` r2\, D\_t)^2\right)\right)\Bigg) \;||\\
&\Bigg(Km1 > -1.` cAMP \&\& cAMP > 0 \&\& r2 > 0 \&\& D\_t < 0 \&\& r1 < 0 \&\& Km2 < -1.` D\_t \&\&\\
&\quad W0 < \frac{-1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t}{cAMP\, r1 - 1.` r2\, D\_t} -\\
&\qquad 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\, Km2\, r1\, r2\, D\_t + cAMP\, Km1\, Km2\, r1\, r2\, D\_t + cAMP^2\, r1\, r2\, D\_t^2 +\right.\right.\right.\right.\\
&\qquad\qquad \left.\left.\left.\left. cAMP\, Km1\, r1\, r2\, D\_t^2\right)\right) \Big/ (cAMP\, r1 - 1.` r2\, D\_t)^2\right)\right)\Bigg) \;||\\
&\Bigg(Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 > 0 \&\& D\_t < 0 \&\&\\
&\quad W0 < \frac{-1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t}{cAMP\, r1 - 1.` r2\, D\_t} -\\
&\qquad 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\, Km2\, r1\, r2\, D\_t + cAMP\, Km1\, Km2\, r1\, r2\, D\_t + cAMP^2\, r1\, r2\, D\_t^2 +\right.\right.\right.\right.\\
&\qquad\qquad \left.\left.\left.\left. cAMP\, Km1\, r1\, r2\, D\_t^2\right)\right) \Big/ (cAMP\, r1 - 1.` r2\, D\_t)^2\right)\right)\Bigg) \;||\\
&\Bigg(Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& D\_t < 0 \&\& r2 < 0 \&\& r1 < 0 \&\&\\
&\qquad -1.` cAMP\, Km2\, r1 - 1.` cAMP\, r1\, D\_t + cAMP\, r2\, D\_t + Km1\, r2\, D\_t
\end{aligned}
$$

$$W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} -$$
$$2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)}$$

$$\left(\text{Km1} > -1.` \text{cAMP} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{r1} > 0 \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{cAMP} < 0 \&\& W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} - 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)}\right) ||$$

$$\left(\text{Km1} > -1.` \text{cAMP} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{r1} < 0 \&\& \text{cAMP} < 0 \&\& W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} - 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)}\right) ||$$

$$\left(\text{Km1} > -1.` \text{cAMP} \&\& \text{r1} > 0 \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{cAMP} < 0 \&\& \text{Km2} < -1.` \text{D\_t} \&\& W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} - 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)}\right) ||$$

$$\left(\text{Km1} > -1.` \text{cAMP} \&\& W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{cAMP} > 0 \&\& \text{r1} > 0 \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{Km2} < -1.` \text{D\_t}\right) || \left(\text{Km1} > -1.` \text{cAMP} \&\& W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{cAMP} > 0 \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{r1} < 0 \&\& \text{Km2} < -1.` \text{D\_t}\right) || \left(\text{Km1} > -1.` \text{cAMP} \&\& W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{cAMP} > 0 \&\& \text{r1} > 0 \&\& \text{r2} > 0 \&\& \text{D\_t} < 0\right) || \left(\text{Km1} > -1.` \text{cAMP} \&\& W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}}\right.$$

$$W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{cAMP} > 0 \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{r1} < 0 \Big) \mid\mid \Big(\text{Km1} > -1.` \text{cAMP} \&\&$$

$$W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{r1} > 0 \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{cAMP} < 0 \Big) \mid\mid \Big(\text{Km1} > -1.` \text{cAMP} \&\&$$

$$W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{Km2} > -1.` \text{D\_t} \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{r1} < 0 \&\& \text{cAMP} < 0 \Big) \mid\mid \Big(\text{Km1} > -1.` \text{cAMP} \&\&$$

$$W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{r1} > 0 \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{cAMP} < 0 \&\& \text{Km2} < -1.` \text{D\_t} \Big) \mid\mid \Big(\text{Km1} > -1.` \text{cAMP} \&\&$$

$$W0 > \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} + 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{r1} < 0 \&\& \text{cAMP} < 0 \&\& \text{Km2} < -1.` \text{D\_t} \Big) \mid\mid \Big(\text{Km1} > -1.` \text{cAMP} \&\&$$

$$\text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{r1} < 0 \&\& \text{cAMP} < 0 \&\& \text{Km2} < -1.` \text{D\_t} \&\& W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} - 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \Big) \mid\mid$$

$$\Big(\text{Km2} > -1.` \text{D\_t} \&\& \text{cAMP} > 0 \&\& \text{r1} > 0 \&\& \text{D\_t} < 0 \&\& \text{r2} < 0 \&\& \text{Km1} < -1.` \text{cAMP} \&\& W0 < \frac{-1.` \text{cAMP Km2 r1} - 1.` \text{cAMP r1 D\_t} + \text{cAMP r2 D\_t} + \text{Km1 r2 D\_t}}{\text{cAMP r1} - 1.` \text{r2 D\_t}} - 2.` \sqrt{-\left(\left(1.` \left(\text{cAMP}^2 \text{Km2 r1 r2 D\_t} + \text{cAMP Km1 Km2 r1 r2 D\_t} + \text{cAMP}^2 \text{r1 r2 D\_t}^2 + \text{cAMP Km1 r1 r2 D\_t}^2\right)\right) / \left(\text{cAMP r1} - 1.` \text{r2 D\_t}\right)^2\right)} \Big) \mid\mid$$

$$\Big(\text{Km2} > -1.` \text{D\_t} \&\& \text{cAMP} > 0 \&\& \text{r2} > 0 \&\& \text{D\_t} < 0 \&\& \text{r1} < 0 \&\& \text{Km1} < -1.` \text{cAMP} \&\&$$

$$W0 < \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \Bigg) \Bigg| \Bigg|$$

$$\Bigg(Km2 > -1.` \, D\_t \&\& \, r1 > 0 \&\& \, r2 > 0 \&\& \, D\_t < 0 \&\& \, cAMP < 0 \&\& \, Km1 < -1.` \, cAMP \&\& W0 < \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \Bigg) \Bigg| \Bigg|$$

$$\Bigg(Km2 > -1.` \, D\_t \&\& \, D\_t < 0 \&\& \, r2 < 0 \&\& \, r1 < 0 \&\& \, cAMP < 0 \&\& \, Km1 < -1.` \, cAMP \&\& W0 < \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \Bigg) \Bigg| \Bigg|$$

$$\Bigg(r1 > 0 \&\& \, D\_t < 0 \&\& \, r2 < 0 \&\& \, cAMP < 0 \&\& \, Km2 < -1.` \, D\_t \&\& \, Km1 < -1.` \, cAMP \&\& W0 < \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \Bigg) \Bigg| \Bigg|$$

$$\Bigg(r2 > 0 \&\& \, D\_t < 0 \&\& \, r1 < 0 \&\& \, cAMP < 0 \&\& \, Km2 < -1.` \, D\_t \&\& \, Km1 < -1.` \, cAMP \&\& W0 < \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \Bigg) \Bigg| \Bigg|$$

$$\Bigg(W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \&\& cAMP > 0 \&\& \, r1 > 0 \&\& \, r2 > 0 \&\& \, D\_t < 0 \&\& \, Km2 < -1.` \, D\_t \&\& \, Km1 < -1.` \, cAMP \Bigg) \Bigg| \Bigg|$$

$$\Bigg(W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) \Big/ \left(cAMP \, r1 - 1.` \, r2 \, D\_t\right)^2\right)\right)} \&\& cAMP > 0 \&\& \, D\_t < 0 \&\& \, r2 < 0 \&\& \, r1 < 0 \&\& \, Km2 < -1.` \, D\_t \&\& \, Km1 < -1.` \, cAMP \Bigg) \Bigg| \Bigg|$$

```
(
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   Km2 > -1.` D_t && cAMP > 0 && r1 > 0 && D_t < 0 && r2 < 0 && Km1 < -1.` cAMP) ||
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   Km2 > -1.` D_t && cAMP > 0 && r2 > 0 && D_t < 0 && r1 < 0 && Km1 < -1.` cAMP) ||
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   Km2 > -1.` D_t && r1 > 0 && r2 > 0 && D_t < 0 && cAMP < 0 && Km1 < -1.` cAMP) ||
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   Km2 > -1.` D_t && D_t < 0 && r2 < 0 && r1 < 0 && cAMP < 0 && Km1 < -1.` cAMP) ||
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   r1 > 0 && D_t < 0 && r2 < 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) +
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)] &&
   r2 > 0 && D_t < 0 && r1 < 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && cAMP > 0 && r1 > 0 && r2 < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP &&
   W0 < (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t)/(cAMP r1 - 1.` r2 D_t) -
     2.` Sqrt[-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                cAMP Km1 r1 r2 D_t^2))/(cAMP r1 - 1.` r2 D_t)^2)]) ||
)
```

$$\left(D\_t > 0 \&\& cAMP > 0 \&\& r2 > 0 \&\& r1 < 0 \&\& Km2 < -1.` D\_t \&\& Km1 < -1.` cAMP \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 > 0 \&\& Km2 < -1.` D\_t \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& cAMP > 0 \&\& r2 < 0 \&\& r1 < 0 \&\& Km2 < -1.` D\_t \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 < 0 \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& cAMP > 0 \&\& r2 > 0 \&\& r1 < 0 \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& r1 > 0 \&\& r2 > 0 \&\& cAMP < 0 \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.` r2\ D\_t} - 2.` \sqrt{\left(-\left(\left(1.` \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.` r2\ D\_t\right)^2\right)\right)}\right) ||$$

$$\left(D\_t > 0 \&\& Km1 > -1.` cAMP \&\& Km2 > -1.` D\_t \&\& r2 < 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& W0 < \frac{-1.` cAMP\ Km2\ r1 - 1.` cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{}\right.$$

$$W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\ \Bigg) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km1 > -1.\text{`}\ cAMP \&\& r1 > 0 \&\& r2 < 0 \&\& cAMP < 0 \&\& Km2 < -1.\text{`}\ D\_t \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\right) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km1 > -1.\text{`}\ cAMP \&\& r2 > 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km2 < -1.\text{`}\ D\_t \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\right) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km2 > -1.\text{`}\ D\_t \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 > 0 \&\& Km1 < -1.\text{`}\ cAMP \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\right) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km2 > -1.\text{`}\ D\_t \&\& cAMP > 0 \&\& r2 < 0 \&\& r1 < 0 \&\& Km1 < -1.\text{`}\ cAMP \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\right) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km2 > -1.\text{`}\ D\_t \&\& r1 > 0 \&\& r2 < 0 \&\& cAMP < 0 \&\& Km1 < -1.\text{`}\ cAMP \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 + cAMP\ Km1\ r1\ r2\ D\_t^2\right)\right) / \left(cAMP\ r1 - 1.\text{`}\ r2\ D\_t\right)^2\right)\right)}\right) \Bigg|\Bigg|$$

$$\left(D\_t > 0 \&\& Km2 > -1.\text{`}\ D\_t \&\& r2 > 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km1 < -1.\text{`}\ cAMP \&\& W0 < \frac{-1.\text{`}\ cAMP\ Km2\ r1 - 1.\text{`}\ cAMP\ r1\ D\_t + cAMP\ r2\ D\_t + Km1\ r2\ D\_t}{cAMP\ r1 - 1.\text{`}\ r2\ D\_t} - 2.\text{`}\ \sqrt{\left(-\left(\left(1.\text{`}\ \left(cAMP^2\ Km2\ r1\ r2\ D\_t + cAMP\ Km1\ Km2\ r1\ r2\ D\_t + cAMP^2\ r1\ r2\ D\_t^2 +\right.\right.\right.\right.$$

$$\left(\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\Big)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\Big)\Big)\Big]\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{r1}>0\;\&\&\;\mathrm{r2}>0\;\&\&\;\mathrm{cAMP}<0\;\&\&\;\mathrm{Km2}<-1.`\,\mathrm{D\_t}\;\&\&\;\mathrm{Km1}<-1.`\,\mathrm{cAMP}\;\&\&\right.$$

$$\mathrm{W0}<\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}-$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\Big]\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{cAMP}>0\;\&\&\;\mathrm{r1}>0\;\&\&\;\mathrm{r2}<0\;\&\&\;\mathrm{Km2}<-1.`\,\mathrm{D\_t}\;\&\&\;\mathrm{Km1}<-1.`\,\mathrm{cAMP}\right)\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{cAMP}>0\;\&\&\;\mathrm{r2}>0\;\&\&\;\mathrm{r1}<0\;\&\&\;\mathrm{Km2}<-1.`\,\mathrm{D\_t}\;\&\&\;\mathrm{Km1}<-1.`\,\mathrm{cAMP}\right)\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{Km1}>-1.`\,\mathrm{cAMP}\;\&\&\;\mathrm{cAMP}>0\;\&\&\;\mathrm{r1}>0\;\&\&\;\mathrm{r2}>0\;\&\&\;\mathrm{Km2}<-1.`\,\mathrm{D\_t}\right)\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{Km1}>-1.`\,\mathrm{cAMP}\;\&\&\;\mathrm{cAMP}>0\;\&\&\;\mathrm{r2}<0\;\&\&\;\mathrm{r1}<0\;\&\&\;\mathrm{Km2}<-1.`\,\mathrm{D\_t}\right)\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{Km1}>-1.`\,\mathrm{cAMP}\;\&\&\;\mathrm{Km2}>-1.`\,\mathrm{D\_t}\;\&\&\;\mathrm{cAMP}>0\;\&\&\;\mathrm{r1}>0\;\&\&\;\mathrm{r2}<0\right)\;||$$

$$\left(\mathrm{D\_t}>0\;\&\&\;\mathrm{W0}>\frac{-1.`\,\mathrm{cAMP}\,\mathrm{Km2}\,\mathrm{r1}-1.`\,\mathrm{cAMP}\,\mathrm{r1}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{Km1}\,\mathrm{r2}\,\mathrm{D\_t}}{\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}}+\right.$$

$$2.`\,\sqrt{\left(-\left(\left(1.`\,\left(\mathrm{cAMP}^2\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{Km2}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}+\mathrm{cAMP}^2\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\mathrm{cAMP}\,\mathrm{Km1}\,\mathrm{r1}\,\mathrm{r2}\,\mathrm{D\_t}^2\right)\right)\Big/\left(\mathrm{cAMP}\,\mathrm{r1}-1.`\,\mathrm{r2}\,\mathrm{D\_t}\right)^2\right)\right)\;\&\&$$

$$\left.\mathrm{Km1}>-1.`\,\mathrm{cAMP}\;\&\&\;\mathrm{Km2}>-1.`\,\mathrm{D\_t}\;\&\&\;\mathrm{cAMP}>0\;\&\&\;\mathrm{r2}>0\;\&\&\;\mathrm{r1}<0\right)\;||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km1 > -1.` \, cAMP \&\& Km2 > -1.` \, D\_t \&\& r1 > 0 \&\& r2 > 0 \&\& cAMP < 0\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km1 > -1.` \, cAMP \&\& Km2 > -1.` \, D\_t \&\& r2 < 0 \&\& r1 < 0 \&\& cAMP < 0\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km1 > -1.` \, cAMP \&\& r1 > 0 \&\& r2 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` \, D\_t\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km1 > -1.` \, cAMP \&\& r2 > 0 \&\& r1 < 0 \&\& cAMP < 0 \&\& Km2 < -1.` \, D\_t\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km2 > -1.` \, D\_t \&\& cAMP > 0 \&\& r1 > 0 \&\& r2 > 0 \&\& Km1 < -1.` \, cAMP\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km2 > -1.` \, D\_t \&\& cAMP > 0 \&\& r2 < 0 \&\& r1 < 0 \&\& Km1 < -1.` \, cAMP\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} + 2.` \sqrt{-\left(\left(1.` \left(cAMP^2 \, Km2 \, r1 \, r2 \, D\_t + cAMP \, Km1 \, Km2 \, r1 \, r2 \, D\_t + cAMP^2 \, r1 \, r2 \, D\_t^2 + cAMP \, Km1 \, r1 \, r2 \, D\_t^2\right)\right) / (cAMP \, r1 - 1.` \, r2 \, D\_t)^2\right)} \&\& Km2 > -1.` \, D\_t \&\& r1 > 0 \&\& r2 < 0 \&\& cAMP < 0 \&\& Km1 < -1.` \, cAMP\right) ||$$

$$\left(D\_t > 0 \&\& W0 > \frac{-1.` \, cAMP \, Km2 \, r1 - 1.` \, cAMP \, r1 \, D\_t + cAMP \, r2 \, D\_t + Km1 \, r2 \, D\_t}{cAMP \, r1 - 1.` \, r2 \, D\_t} +$$

```
(                                                cAMP r1 - 1.` r2 D_t
      2.` √(-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                  cAMP Km1 r1 r2 D_t^2)) / (cAMP r1 - 1.` r2 D_t)^2)) &&
    Km2 > -1.` D_t && r2 > 0 && r1 < 0 && cAMP < 0 && Km1 < -1.` cAMP) ||
 (D_t > 0 && W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t) /
                  (cAMP r1 - 1.` r2 D_t) +
      2.` √(-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                  cAMP Km1 r1 r2 D_t^2)) / (cAMP r1 - 1.` r2 D_t)^2)) &&
    r1 > 0 && r2 > 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && W0 > (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t) /
                  (cAMP r1 - 1.` r2 D_t) +
      2.` √(-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                  cAMP Km1 r1 r2 D_t^2)) / (cAMP r1 - 1.` r2 D_t)^2)) &&
    r2 < 0 && r1 < 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP) ||
 (D_t > 0 && r2 < 0 && r1 < 0 && cAMP < 0 && Km2 < -1.` D_t && Km1 < -1.` cAMP &&
    W0 < (-1.` cAMP Km2 r1 - 1.` cAMP r1 D_t + cAMP r2 D_t + Km1 r2 D_t) /
                  (cAMP r1 - 1.` r2 D_t) -
      2.` √(-((1.` (cAMP^2 Km2 r1 r2 D_t + cAMP Km1 Km2 r1 r2 D_t + cAMP^2 r1 r2 D_t^2 +
                  cAMP Km1 r1 r2 D_t^2)) / (cAMP r1 - 1.` r2 D_t)^2)))
```

```
(0.5` (-1.` cAMP Km2 r1 + cAMP r1 W0 - 1.` cAMP r1 D_t -
        1.` cAMP r2 D_t - 1.` Km1 r2 D_t - 1.` r2 W0 D_t)) / (cAMP r1 - 1.` r2 D_t) +
  0.5` √((cAMP^2 Km2^2 r1^2 + 2.` cAMP^2 Km2 r1^2 W0 + cAMP^2 r1^2 W0^2 + 2.` cAMP^2 Km2 r1^2 D_t +
        2.` cAMP^2 Km2 r1 r2 D_t + 2.` cAMP Km1 Km2 r1 r2 D_t + 2.` cAMP^2 r1^2 W0 D_t -
        2.` cAMP^2 r1 r2 W0 D_t - 2.` cAMP Km1 r1 r2 W0 D_t - 2.` cAMP Km2 r1 r2 W0 D_t -
        2.` cAMP r1 r2 W0^2 D_t + cAMP^2 r1^2 D_t^2 + 2.` cAMP^2 r1 r2 D_t^2 +
        2.` cAMP Km1 r1 r2 D_t^2 + cAMP^2 r2^2 D_t^2 + 2.` cAMP Km1 r2^2 D_t^2 + Km1^2 r2^2 D_t^2 -
        2.` cAMP r1 r2 W0 D_t^2 + 2.` cAMP r2^2 W0 D_t^2 + 2.` Km1 r2^2 W0 D_t^2 + r2^2 W0^2 D_t^2) /
      (cAMP r1 - 1.` r2 D_t)^2) if condition
```

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Out[32]=
$$\left\{\left\{\text{AC\_pt} \to \frac{0.5\,(-1.\,\text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\,\text{cAMP r1 D\_t} - 1.\,\text{cAMP r2 D\_t} - 1.\,\text{Km1 r2 D\_t} - 1.\,\text{r2}}{\text{cAMP r1} - 1.\,\text{r2 D\_t}}\right.\right.$$
$$-$$
$$0.5\sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\,\text{r2 D\_t})^2}\left(\text{cAMP}^2\,\text{Km2}^2\,\text{r1}^2 + 2.\,\text{cAMP}^2\,\text{Km2 r1}^2\,\text{W0} + \text{cAMP}^2\,\text{r1}^2\,\text{W0}^2 + 2.\right.\right.$$
$$\text{Km2 r1}^2\,\text{D\_t} + 2.\,\text{cAMP}^2\,\text{Km2 r1 r2 D\_t} + 2.\,\text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\,\text{cAMP}^2\,\text{r1}^2\,\text{W}$$
$$2.\,\text{cAMP}^2\,\text{r1 r2 W0 D\_t} - 2.\,\text{cAMP Km1 r1 r2 W0 D\_t} - 2.\,\text{cAMP Km2 r1 r2 W0 D\_t} -$$
$$2.\,\text{cAMP r1 r2 W0}^2\,\text{D\_t} + \text{cAMP}^2\,\text{r1}^2\,\text{D\_t}^2 + 2.\,\text{cAMP}^2\,\text{r1 r2 D\_t}^2 + 2.\,\text{cAMP Km1 r1 r2 D\_}$$
$$\text{cAMP}^2\,\text{r2}^2\,\text{D\_t}^2 + 2.\,\text{cAMP Km1 r2}^2\,\text{D\_t}^2 + \text{Km1}^2\,\text{r2}^2\,\text{D\_t}^2 - 2.\,\text{cAMP r1 r2 W0 D\_t}^2 +$$
$$\left.\left.\left.2.\,\text{cAMP r2}^2\,\text{W0 D\_t}^2 + 2.\,\text{Km1 r2}^2\,\text{W0 D\_t}^2 + \text{r2}^2\,\text{W0}^2\,\text{D\_t}^2\right)\right)\right\}\right\} \text{ if } \boxed{\textit{condition}\ +}$$

In[33]:=
```
(0.5 (-1. cAMP Km2 r1 + cAMP r1 W0 - 1. cAMP r1 D_t -
      1. cAMP r2 D_t - 1. Km1 r2 D_t - 1. r2 W0 D_t)) / (cAMP r1 - 1. r2 D_t) + 0.5
 √((cAMP^2 Km2^2 r1^2 + 2. cAMP^2 Km2 r1^2 W0 + cAMP^2 r1^2 W0^2 + 2. cAMP^2 Km2 r1^2 D_t +
     2. cAMP^2 Km2 r1 r2 D_t + 2. cAMP Km1 Km2 r1 r2 D_t + 2. cAMP^2 r1^2 W0 D_t -
     2. cAMP^2 r1 r2 W0 D_t - 2. cAMP Km1 r1 r2 W0 D_t - 2. cAMP Km2 r1 r2 W0 D_t -
     2. cAMP r1 r2 W0^2 D_t + cAMP^2 r1^2 D_t^2 + 2. cAMP^2 r1 r2 D_t^2 + 2. cAMP Km1 r1 r2 D_t^2 +
     2. cAMP Km1 r1 r2 D_t^2 + cAMP^2 r2^2 D_t^2 + 2. cAMP^2 r2^2 D_t^2 + 2. cAMP Km1 r2^2 D_t^2 +
     Km1^2 r2^2 D_t^2 - 2. cAMP r1 r2 W0 D_t^2 + 2. cAMP r2^2 W0 D_t^2 + 2. Km1 r2^2 W0 D_t^2 +
     2. cAMP r2^2 W0 D_t^2 + 2. Km1 r2^2 W0 D_t^2 + r2^2 W0^2 D_t^2) / (cAMP r1 - 1. r2 D_t)^2)
```

Out[33]=
$$\frac{0.5\,(-1.\,\text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\,\text{cAMP r1 D\_t} - 1.\,\text{cAMP r2 D\_t} - 1.\,\text{Km1 r2 D\_t} - 1.\,\text{r2 W0 D\_t})}{\text{cAMP r1} - 1.\,\text{r2 D\_t}} +$$
$$0.5\sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\,\text{r2 D\_t})^2}\left(\text{cAMP}^2\,\text{Km2}^2\,\text{r1}^2 + 2.\,\text{cAMP}^2\,\text{Km2 r1}^2\,\text{W0} + \text{cAMP}^2\,\text{r1}^2\,\text{W0}^2 +\right.\right.$$
$$2.\,\text{cAMP}^2\,\text{Km2 r1}^2\,\text{D\_t} + 2.\,\text{cAMP}^2\,\text{Km2 r1 r2 D\_t} + 2.\,\text{cAMP Km1 Km2 r1 r2 D\_t} +$$
$$2.\,\text{cAMP}^2\,\text{r1}^2\,\text{W0 D\_t} - 2.\,\text{cAMP}^2\,\text{r1 r2 W0 D\_t} - 2.\,\text{cAMP Km1 r1 r2 W0 D\_t} -$$
$$2.\,\text{cAMP Km2 r1 r2 W0 D\_t} - 2.\,\text{cAMP r1 r2 W0}^2\,\text{D\_t} + \text{cAMP}^2\,\text{r1}^2\,\text{D\_t}^2 + 2.\,\text{cAMP}^2\,\text{r1 r2 D\_t}^2 +$$
$$2.\,\text{cAMP Km1 r1 r2 D\_t}^2 + \text{cAMP}^2\,\text{r2}^2\,\text{D\_t}^2 + 2.\,\text{cAMP Km1 r2}^2\,\text{D\_t}^2 + \text{Km1}^2\,\text{r2}^2\,\text{D\_t}^2 -$$
$$\left.\left.2.\,\text{cAMP r1 r2 W0 D\_t}^2 + 2.\,\text{cAMP r2}^2\,\text{W0 D\_t}^2 + 2.\,\text{Km1 r2}^2\,\text{W0 D\_t}^2 + \text{r2}^2\,\text{W0}^2\,\text{D\_t}^2\right)\right)$$

In[34]:=
```
ACt = (0.5` (-1.` cAMP Km2 r1 + cAMP r1 W0 - 1.` cAMP r1 D_t -
      1.` cAMP r2 D_t - 1.` Km1 r2 D_t - 1.` r2 W0 D_t)) / (cAMP r1 - 1.` r2 D_t) +
  0.5` Sqrt[(1/(cAMP r1 - 1.` r2 D_t)^2) (cAMP^2 Km2^2 r1^2 + 2.` cAMP^2 Km2 r1^2 W0 + cAMP^2 r1^2 W0^2 +
    2.` cAMP^2 Km2 r1^2 D_t + 2.` cAMP^2 Km2 r1 r2 D_t + 2.` cAMP Km1 Km2 r1 r2 D_t +
    2.` cAMP^2 r1^2 W0 D_t - 2.` cAMP^2 r1 r2 W0 D_t - 2.` cAMP Km1 r1 r2 W0 D_t -
    2.` cAMP Km2 r1 r2 W0 D_t - 2.` cAMP r1 r2 W0^2 D_t + cAMP^2 r1^2 D_t^2 + 2.` cAMP^2 r1 r2 D_t^2 +
    2.` cAMP Km1 r1 r2 D_t^2 + cAMP^2 r2^2 D_t^2 + 2.` cAMP Km1 r2^2 D_t^2 + Km1^2 r2^2 D_t^2 -
    2.` cAMP r1 r2 W0 D_t^2 + 2.` cAMP r2^2 W0 D_t^2 + 2.` Km1 r2^2 W0 D_t^2 + r2^2 W0^2 D_t^2)]
```

Out[34]=
$$\frac{0.5\ (-1.\ \text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\ \text{cAMP r1 D\_t} - 1.\ \text{cAMP r2 D\_t} - 1.\ \text{Km1 r2 D\_t} - 1.\ \text{r2 W0 D\_t})}{\text{cAMP r1} - 1.\ \text{r2 D\_t}} +$$
$$0.5\sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{Km2}^2\ \text{r1}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{W0} + \text{cAMP}^2\ \text{r1}^2\ \text{W0}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{D\_t} + 2.\ \text{cAMP}^2\ \text{Km2 r1 r2 D\_t} + 2.\ \text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\ \text{cAMP}^2\ \text{r1}^2\ \text{W0 D\_t} - 2.\ \text{cAMP}^2\ \text{r1 r2 W0 D\_t} - 2.\ \text{cAMP Km1 r1 r2 W0 D\_t} - 2.\ \text{cAMP Km2 r1 r2 W0 D\_t} - 2.\ \text{cAMP r1 r2 W0}^2\ \text{D\_t} + \text{cAMP}^2\ \text{r1}^2\ \text{D\_t}^2 + 2.\ \text{cAMP}^2\ \text{r1 r2 D\_t}^2 + 2.\ \text{cAMP Km1 r1 r2 D\_t}^2 + \text{cAMP}^2\ \text{r2}^2\ \text{D\_t}^2 + 2.\ \text{cAMP Km1 r2}^2\ \text{D\_t}^2 + \text{Km1}^2\ \text{r2}^2\ \text{D\_t}^2 - 2.\ \text{cAMP r1 r2 W0 D\_t}^2 + 2.\ \text{cAMP r2}^2\ \text{W0 D\_t}^2 + 2.\ \text{Km1 r2}^2\ \text{W0 D\_t}^2 + \text{r2}^2\ \text{W0}^2\ \text{D\_t}^2\right)\right)}$$

In[35]:=
```
ACt
```

Out[35]=
$$\frac{0.5\ (-1.\ \text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\ \text{cAMP r1 D\_t} - 1.\ \text{cAMP r2 D\_t} - 1.\ \text{Km1 r2 D\_t} - 1.\ \text{r2 W0 D\_t})}{\text{cAMP r1} - 1.\ \text{r2 D\_t}} +$$
$$0.5\sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{Km2}^2\ \text{r1}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{W0} + \text{cAMP}^2\ \text{r1}^2\ \text{W0}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{D\_t} + 2.\ \text{cAMP}^2\ \text{Km2 r1 r2 D\_t} + 2.\ \text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\ \text{cAMP}^2\ \text{r1}^2\ \text{W0 D\_t} - 2.\ \text{cAMP}^2\ \text{r1 r2 W0 D\_t} - 2.\ \text{cAMP Km1 r1 r2 W0 D\_t} - 2.\ \text{cAMP Km2 r1 r2 W0 D\_t} - 2.\ \text{cAMP r1 r2 W0}^2\ \text{D\_t} + \text{cAMP}^2\ \text{r1}^2\ \text{D\_t}^2 + 2.\ \text{cAMP}^2\ \text{r1 r2 D\_t}^2 + 2.\ \text{cAMP Km1 r1 r2 D\_t}^2 + \text{cAMP}^2\ \text{r2}^2\ \text{D\_t}^2 + 2.\ \text{cAMP Km1 r2}^2\ \text{D\_t}^2 + \text{Km1}^2\ \text{r2}^2\ \text{D\_t}^2 - 2.\ \text{cAMP r1 r2 W0 D\_t}^2 + 2.\ \text{cAMP r2}^2\ \text{W0 D\_t}^2 + 2.\ \text{Km1 r2}^2\ \text{W0 D\_t}^2 + \text{r2}^2\ \text{W0}^2\ \text{D\_t}^2\right)\right)}$$

In[36]:=
```
OwnValues[ACt]
```

Out[36]=
$$\left\{\text{HoldPattern}[\text{ACt}] :\mapsto \frac{1}{\text{cAMP r1} - 1.\ \text{r2 D\_t}}0.5\ (-1.\ \text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\ \text{cAMP r1 D\_t} - 1.\ \text{cAMP r2 D\_t} - 1.\ \text{Km1 r2 D\_t} - 1.\ \text{r2 W0 D\_t}) + 0.5\sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{Km2}^2\ \text{r1}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{W0} + \text{cAMP}^2\ \text{r1}^2\ \text{W0}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{D\_t} + 2.\ \text{cAMP}^2\ \text{Km2 r1 r2 D\_t} + 2.\ \text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\ \text{cAMP}^2\ \text{r1}^2\ \text{W0 D\_t} - 2.\ \text{cAMP}^2\ \text{r1 r2 W0 D\_t} - 2.\ \text{cAMP Km1 r1 r2 W0 D\_t} - 2.\ \text{cAMP Km2 r1 r2 W0 D\_t} - 2.\ \text{cAMP r1 r2 W0}^2\ \text{D\_t} + \text{cAMP}^2\ \text{r1}^2\ \text{D\_t}^2 + 2.\ \text{cAMP}^2\ \text{r1 r2 D\_t}^2 + 2.\ \text{cAMP Km1 r1 r2 D\_t}^2 + \text{cAMP}^2\ \text{r2}^2\ \text{D\_t}^2 + 2.\ \text{cAMP Km1 r2}^2\ \text{D\_t}^2 + \text{Km1}^2\ \text{r2}^2\ \text{D\_t}^2 - 2.\ \text{cAMP r1 r2 W0 D\_t}^2 + 2.\ \text{cAMP r2}^2\ \text{W0 D\_t}^2 + 2.\ \text{Km1 r2}^2\ \text{W0 D\_t}^2 + \text{r2}^2\ \text{W0}^2\ \text{D\_t}^2\right)\right)}\right\}$$

In[37]:= **Information[ACt]**

Out[37]= Information[

$$\frac{0.5\ (-1.\ \text{cAMP Km2 r1} + \text{cAMP r1 W0} - 1.\ \text{cAMP r1 D\_t} - 1.\ \text{cAMP r2 D\_t} - 1.\ \text{Km1 r2 D\_t} - 1.\ \text{r2 W0 D\_t})}{\text{cAMP r1} - 1.\ \text{r2 D\_t}}$$

$$+ 0.5 \sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\right.}$$

$$\left(\text{cAMP}^2\ \text{Km2}^2\ \text{r1}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{W0} + \text{cAMP}^2\ \text{r1}^2\ \text{W0}^2 + 2.\ \text{cAMP}^2\ \text{Km2 r1}^2\ \text{D\_t} + \right.$$
$$2.\ \text{cAMP}^2\ \text{Km2 r1 r2 D\_t} + 2.\ \text{cAMP Km1 Km2 r1 r2 D\_t} + 2.\ \text{cAMP}^2\ \text{r1}^2\ \text{W0 D\_t} -$$
$$2.\ \text{cAMP}^2\ \text{r1 r2 W0 D\_t} - 2.\ \text{cAMP Km1 r1 r2 W0 D\_t} - 2.\ \text{cAMP Km2 r1 r2 W0 D\_t} -$$
$$2.\ \text{cAMP r1 r2 W0}^2\ \text{D\_t} + \text{cAMP}^2\ \text{r1}^2\ \text{D\_t}^2 + 2.\ \text{cAMP}^2\ \text{r1 r2 D\_t}^2 + 2.\ \text{cAMP Km1 r1 r2 D\_t}^2 +$$
$$\text{cAMP}^2\ \text{r2}^2\ \text{D\_t}^2 + 2.\ \text{cAMP Km1 r2}^2\ \text{D\_t}^2 + \text{Km1}^2\ \text{r2}^2\ \text{D\_t}^2 - 2.\ \text{cAMP r1 r2 W0 D\_t}^2 +$$
$$\left.\left.2.\ \text{cAMP r2}^2\ \text{W0 D\_t}^2 + 2.\ \text{Km1 r2}^2\ \text{W0 D\_t}^2 + \text{r2}^2\ \text{W0}^2\ \text{D\_t}^2\right)\right)\Bigg]$$

In[38]:= **ACpsimple = Simplify[ACt]**

Out[38]=
$$\frac{\text{cAMP r1}\ (-0.5\ \text{Km2} + 0.5\ \text{W0}) + (-0.5\ \text{cAMP r1} - 0.5\ \text{cAMP r2} - 0.5\ \text{Km1 r2} - 0.5\ \text{r2 W0})\ \text{D\_t}}{\text{cAMP r1} - 1.\ \text{r2 D\_t}} +$$

$$0.5 \sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{r1}^2\ \left(\text{Km2}^2 + 2.\ \text{Km2 W0} + \text{W0}^2\right) + \right.\right.$$
$$\text{cAMP r1}\ \left(\text{cAMP}\ (2.\ \text{Km2 r1} + 2.\ \text{Km2 r2} + 2.\ \text{r1 W0} - 2.\ \text{r2 W0}) + \right.$$
$$\left.\text{r2}\ \left(2.\ \text{Km1 Km2} - 2.\ \text{Km1 W0} - 2.\ \text{Km2 W0} - 2.\ \text{W0}^2\right)\right)\ \text{D\_t} +$$
$$\left(\text{cAMP}^2\ \left(\text{r1}^2 + 2.\ \text{r1 r2} + \text{r2}^2\right) + \text{cAMP r2}\ (2.\ \text{Km1 r1} + 2.\ \text{Km1 r2} - 2.\ \text{r1 W0} + 2.\ \text{r2 W0}) + \right.$$
$$\left.\left.\text{r2}^2\ \left(\text{Km1}^2 + 2.\ \text{Km1 W0} + \text{W0}^2\right)\right)\ \text{D\_t}^2\right)\Bigg)$$

In[39]:= **ACpsimple**

Out[39]=
$$\frac{\text{cAMP r1}\ (-0.5\ \text{Km2} + 0.5\ \text{W0}) + (-0.5\ \text{cAMP r1} - 0.5\ \text{cAMP r2} - 0.5\ \text{Km1 r2} - 0.5\ \text{r2 W0})\ \text{D\_t}}{\text{cAMP r1} - 1.\ \text{r2 D\_t}} +$$

$$0.5 \sqrt{\left(\frac{1}{(\text{cAMP r1} - 1.\ \text{r2 D\_t})^2}\left(\text{cAMP}^2\ \text{r1}^2\ \left(\text{Km2}^2 + 2.\ \text{Km2 W0} + \text{W0}^2\right) + \right.\right.$$
$$\text{cAMP r1}\ \left(\text{cAMP}\ (2.\ \text{Km2 r1} + 2.\ \text{Km2 r2} + 2.\ \text{r1 W0} - 2.\ \text{r2 W0}) + \right.$$
$$\left.\text{r2}\ \left(2.\ \text{Km1 Km2} - 2.\ \text{Km1 W0} - 2.\ \text{Km2 W0} - 2.\ \text{W0}^2\right)\right)\ \text{D\_t} +$$
$$\left(\text{cAMP}^2\ \left(\text{r1}^2 + 2.\ \text{r1 r2} + \text{r2}^2\right) + \text{cAMP r2}\ (2.\ \text{Km1 r1} + 2.\ \text{Km1 r2} - 2.\ \text{r1 W0} + 2.\ \text{r2 W0}) + \right.$$
$$\left.\left.\text{r2}^2\ \left(\text{Km1}^2 + 2.\ \text{Km1 W0} + \text{W0}^2\right)\right)\ \text{D\_t}^2\right)\Bigg)$$