In[•]:=
```
dSdteqn[t_, a_] = -β S[t, a] × II[t, a] - μS S[t, a] - D[S[t, a], t] - D[S[t, a], a]
dEEdteqn[t_, a_] =
  (1 - ϵ) β S[t, a] × II[t, a] - δ EE[t, a] - μE EE[t, a] - D[EE[t, a], t] - D[EE[t, a], a]
dIIdteqn[t_, a_] = ϵ β S[t, a] × II[t, a] + δ EE[t, a] -
   μI II[t, a] - D[II[t, a], t] - D[II[t, a], a]
```

Out[•]= $-\mu S\, S[t, a] - \beta\, II[t, a] \times S[t, a] - S^{(0,1)}[t, a] - S^{(1,0)}[t, a]$

Out[•]= $-\delta\, EE[t, a] - \mu E\, EE[t, a] + \beta\, (1 - \epsilon)\, II[t, a] \times S[t, a] - EE^{(0,1)}[t, a] - EE^{(1,0)}[t, a]$

Out[•]= $\delta\, EE[t, a] - \mu I\, II[t, a] + \beta\, \epsilon\, II[t, a] \times S[t, a] - II^{(0,1)}[t, a] - II^{(1,0)}[t, a]$

In[•]:=
```
yEeqn[t_, a_] = kE EE[t, a] - yE[t, a]
yIeqn[t_, a_] = kI (ϵ β S[t, a] × II[t, a] + δ EE[t, a]) - yI[t, a]
```

Out[•]= $kE\, EE[t, a] - yE[t, a]$

Out[•]= $kI\, (\delta\, EE[t, a] + \beta\, \epsilon\, II[t, a] \times S[t, a]) - yI[t, a]$

In[•]:=
```
yEmap[t_, a_] = Solve[yEeqn[t, a] == 0, EE[t, a]][[1]]
yImap[t_, a_] = Solve[yIeqn[t, a] == 0, II[t, a]][[1]]
```

Out[•]= $\left\{EE[t, a] \to \frac{yE[t, a]}{kE}\right\}$

Out[•]= $\left\{II[t, a] \to \frac{-kI\, \delta\, EE[t, a] + yI[t, a]}{kI\, \beta\, \epsilon\, S[t, a]}\right\}$

In[•]:=
```
dSdteqn2[t_, a_] =
 dSdteqn[t, a] /. yImap[t, a] /. D[yImap[t, a], t] /. D[yImap[t, a], a] /. yEmap[t, a] /.
   D[yEmap[t, a], t] /. D[yEmap[t, a], a]
dEEdteqn2[t_, a_] = dEEdteqn[t, a] /. yImap[t, a] /. D[yImap[t, a], t] /.
     D[yImap[t, a], a] /. yEmap[t, a] /. D[yEmap[t, a], t] /. D[yEmap[t, a], a]
dIIdteqn2[t_, a_] = dIIdteqn[t, a] /. yImap[t, a] /. D[yImap[t, a], t] /.
     D[yImap[t, a], a] /. yEmap[t, a] /. D[yEmap[t, a], t] /. D[yEmap[t, a], a]
```

Out[•]= $-\mu S\, S[t, a] - \frac{-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]}{kI\, \epsilon} - S^{(0,1)}[t, a] - S^{(1,0)}[t, a]$

Out[•]= $-\frac{\delta\, yE[t, a]}{kE} - \frac{\mu E\, yE[t, a]}{kE} + \frac{(1 - \epsilon)\left(-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]\right)}{kI\, \epsilon} - \frac{yE^{(0,1)}[t, a]}{kE} - \frac{yE^{(1,0)}[t, a]}{kE}$

Out[•]= $\frac{\delta\, yE[t, a]}{kE} + \frac{-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]}{kI} - \frac{\mu I\left(-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]\right)}{kI\, \beta\, \epsilon\, S[t, a]} + \frac{\left(-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]\right) S^{(0,1)}[t, a]}{kI\, \beta\, \epsilon\, S[t, a]^2} - \frac{-\frac{kI\, \delta\, yE^{(0,1)}[t,a]}{kE} + yI^{(0,1)}[t, a]}{kI\, \beta\, \epsilon\, S[t, a]} + \frac{\left(-\frac{kI\, \delta\, yE[t,a]}{kE} + yI[t, a]\right) S^{(1,0)}[t, a]}{kI\, \beta\, \epsilon\, S[t, a]^2} - \frac{-\frac{kI\, \delta\, yE^{(1,0)}[t,a]}{kE} + yI^{(1,0)}[t, a]}{kI\, \beta\, \epsilon\, S[t, a]}$

In[∘]:=
```
dIIdteqn22[t_, a_] =
 Simplify[dIIdteqn2[t, a] /. {S^(0,1)[t, a] → -β S[t, a] × II[t, a] -
      μS S[t, a] - D[S[t, a], t]}] /. yImap[t, a] /. yEmap[t, a]
```

Out[∘]=
$$\frac{1}{kE\,kI\,\beta\,\epsilon\,S[t,a]}\left(kI\,\delta\,yE[t,a]\left(\mu I+\mu S+\frac{-\frac{kI\,\delta\,yE[t,a]}{kE}+yI[t,a]}{kI\,\epsilon\,S[t,a]}\right)-kE\,yI[t,a]\left(\mu I+\mu S-\beta\,\epsilon\,S[t,a]+\frac{-\frac{kI\,\delta\,yE[t,a]}{kE}+yI[t,a]}{kI\,\epsilon\,S[t,a]}\right)+kI\,\delta\,yE^{(0,1)}[t,a]-kE\,yI^{(0,1)}[t,a]+kI\,\delta\,yE^{(1,0)}[t,a]-kE\,yI^{(1,0)}[t,a]\right)$$

In[∘]:=
```
Smap[t_, a_] = Solve[dIIdteqn22[t, a] == 0, S[t, a]][[1]]
```

Out[∘]=
$$\left\{S[t,a]\to\frac{1}{2\,kE^2\,kI\,\beta\,\epsilon^2\,yI[t,a]}\left(-kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE[t,a]-kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE[t,a]+kE^2\,kI\,\epsilon\,\mu I\,yI[t,a]+kE^2\,kI\,\epsilon\,\mu S\,yI[t,a]-kE\,kI^2\,\delta\,\epsilon\,yE^{(0,1)}[t,a]+kE^2\,kI\,\epsilon\,yI^{(0,1)}[t,a]-kE\,kI^2\,\delta\,\epsilon\,yE^{(1,0)}[t,a]+kE^2\,kI\,\epsilon\,yI^{(1,0)}[t,a]-\sqrt{\left(-4\,kE^2\,kI\,\beta\,\epsilon^2\,yI[t,a]\left(-kI^2\,\delta^2\,yE[t,a]^2+2\,kE\,kI\,\delta\,yE[t,a]\times yI[t,a]-kE^2\,yI[t,a]^2\right)+\left(kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE[t,a]+kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE[t,a]-kE^2\,kI\,\epsilon\,\mu I\,yI[t,a]-kE^2\,kI\,\epsilon\,\mu S\,yI[t,a]+kE\,kI^2\,\delta\,\epsilon\,yE^{(0,1)}[t,a]-kE^2\,kI\,\epsilon\,yI^{(0,1)}[t,a]+kE\,kI^2\,\delta\,\epsilon\,yE^{(1,0)}[t,a]-kE^2\,kI\,\epsilon\,yI^{(1,0)}[t,a]\right)^2\right)}\right)\right\}$$

In[∘]:=
```
s2map[t_, a_] = {S[t, a] → (p1[t, a] - √p2[t, a]) / p3[t, a]}
```

Out[∘]=
$$\left\{S[t,a]\to\frac{p1[t,a]-\sqrt{p2[t,a]}}{p3[t,a]}\right\}$$

In[∘]:=
```
dSdteqn3[t_, a_] =
 dSdteqn2[t, a] /. s2map[t, a] /. D[s2map[t, a], t] /. D[s2map[t, a], a]
dEEdteqn3[t_, a_] = dEEdteqn2[t, a]
```

Out[∘]=
$$-\frac{\mu S\left(p1[t,a]-\sqrt{p2[t,a]}\right)}{p3[t,a]}-\frac{-\frac{kI\,\delta\,yE[t,a]}{kE}+yI[t,a]}{kI\,\epsilon}-\frac{p1^{(0,1)}[t,a]-\frac{p2^{(0,1)}[t,a]}{2\sqrt{p2[t,a]}}}{p3[t,a]}+\frac{\left(p1[t,a]-\sqrt{p2[t,a]}\right)p3^{(0,1)}[t,a]}{p3[t,a]^2}-\frac{p1^{(1,0)}[t,a]-\frac{p2^{(1,0)}[t,a]}{2\sqrt{p2[t,a]}}}{p3[t,a]}+\frac{\left(p1[t,a]-\sqrt{p2[t,a]}\right)p3^{(1,0)}[t,a]}{p3[t,a]^2}$$

Out[∘]=
$$-\frac{\delta\,yE[t,a]}{kE}-\frac{\mu E\,yE[t,a]}{kE}+\frac{(1-\epsilon)\left(-\frac{kI\,\delta\,yE[t,a]}{kE}+yI[t,a]\right)}{kI\,\epsilon}-\frac{yE^{(0,1)}[t,a]}{kE}-\frac{yE^{(1,0)}[t,a]}{kE}$$

In[∘]:=
```
s2thing[t_, a_] = Collect[
  Together[dSdteqn3[t, a]] × Denominator[Together[dSdteqn3[t, a]]], √p2[t, a]]
```

Out[∘]=
$$kE\,kI\,\epsilon\,p3[t,a]\,p2^{(0,1)}[t,a]+kE\,kI\,\epsilon\,p3[t,a]\,p2^{(1,0)}[t,a]+p2[t,a]\left(2\,kE\,kI\,\epsilon\,\mu S\,p3[t,a]-2\,kE\,kI\,\epsilon\,p3^{(0,1)}[t,a]-2\,kE\,kI\,\epsilon\,p3^{(1,0)}[t,a]\right)+\sqrt{p2[t,a]}\left(-2\,kE\,kI\,\epsilon\,\mu S\,p1[t,a]\times p3[t,a]+2\,kI\,\delta\,p3[t,a]^2\,yE[t,a]-2\,kE\,p3[t,a]^2\,yI[t,a]-2\,kE\,kI\,\epsilon\,p3[t,a]\,p1^{(0,1)}[t,a]+2\,kE\,kI\,\epsilon\,p1[t,a]\,p3^{(0,1)}[t,a]-2\,kE\,kI\,\epsilon\,p3[t,a]\,p1^{(1,0)}[t,a]+2\,kE\,kI\,\epsilon\,p1[t,a]\,p3^{(1,0)}[t,a]\right)$$

In[∘]:=
```
part2[t_, a_] = Coefficient[s2thing[t, a], √p2[t, a]]
```

Out[∘]=
$$-2\,kE\,kI\,\epsilon\,\mu S\,p1[t,a]\times p3[t,a]+2\,kI\,\delta\,p3[t,a]^2\,yE[t,a]-2\,kE\,p3[t,a]^2\,yI[t,a]-2\,kE\,kI\,\epsilon\,p3[t,a]\,p1^{(0,1)}[t,a]+2\,kE\,kI\,\epsilon\,p1[t,a]\,p3^{(0,1)}[t,a]-2\,kE\,kI\,\epsilon\,p3[t,a]\,p1^{(1,0)}[t,a]+2\,kE\,kI\,\epsilon\,p1[t,a]\,p3^{(1,0)}[t,a]$$

In[∘]:=
```
part1[t_, a_] = s2thing[t, a] - part2[t, a] √p2[t, a]
```

Out[∘]=
$$kE\,kI\,\epsilon\,p3[t,a]\,p2^{(0,1)}[t,a]+kE\,kI\,\epsilon\,p3[t,a]\,p2^{(1,0)}[t,a]+p2[t,a]\left(2\,kE\,kI\,\epsilon\,\mu S\,p3[t,a]-2\,kE\,kI\,\epsilon\,p3^{(0,1)}[t,a]-2\,kE\,kI\,\epsilon\,p3^{(1,0)}[t,a]\right)$$

In[∘]:=
```
s2thing2[t_, a_] = Expand[s2thing[t, a] (part1[t, a] - Sqrt[p2[t, a]] part2[t, a])]
```

Out[∘]=
```
-4 kE^2 kI^2 ϵ^2 μS^2 p1[t, a]^2 p2[t, a] p3[t, a]^2 + 4 kE^2 kI^2 ϵ^2 μS^2 p2[t, a]^2 p3[t, a]^2 +
 8 kE kI^2 δ ϵ μS p1[t, a] × p2[t, a] p3[t, a]^3 yE[t, a] -
 4 kI^2 δ^2 p2[t, a] p3[t, a]^4 yE[t, a]^2 - 8 kE^2 kI ϵ μS p1[t, a] × p2[t, a] p3[t, a]^3 yI[t, a] +
 8 kE kI δ p2[t, a] p3[t, a]^4 yE[t, a] × yI[t, a] - 4 kE^2 p2[t, a] p3[t, a]^4 yI[t, a]^2 -
 8 kE^2 kI^2 ϵ^2 μS p1[t, a] × p2[t, a] p3[t, a]^2 p1^(0,1)[t, a] +
 8 kE kI^2 δ ϵ p2[t, a] p3[t, a]^3 yE[t, a] p1^(0,1)[t, a] -
 8 kE^2 kI ϵ p2[t, a] p3[t, a]^3 yI[t, a] p1^(0,1)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] p3[t, a]^2 p1^(0,1)[t, a]^2 +
 4 kE^2 kI^2 ϵ^2 μS p2[t, a] p3[t, a]^2 p2^(0,1)[t, a] + kE^2 kI^2 ϵ^2 p3[t, a]^2 p2^(0,1)[t, a]^2 +
 8 kE^2 kI^2 ϵ^2 μS p1[t, a]^2 p2[t, a] × p3[t, a] p3^(0,1)[t, a] -
 8 kE^2 kI^2 ϵ^2 μS p2[t, a]^2 p3[t, a] p3^(0,1)[t, a] -
 8 kE kI^2 δ ϵ p1[t, a] × p2[t, a] p3[t, a]^2 yE[t, a] p3^(0,1)[t, a] +
 8 kE^2 kI ϵ p1[t, a] × p2[t, a] p3[t, a]^2 yI[t, a] p3^(0,1)[t, a] +
 8 kE^2 kI^2 ϵ^2 p1[t, a] × p2[t, a] × p3[t, a] p1^(0,1)[t, a] p3^(0,1)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] × p3[t, a] p2^(0,1)[t, a] p3^(0,1)[t, a] -
 4 kE^2 kI^2 ϵ^2 p1[t, a]^2 p2[t, a] p3^(0,1)[t, a]^2 + 4 kE^2 kI^2 ϵ^2 p2[t, a]^2 p3^(0,1)[t, a]^2 -
 8 kE^2 kI^2 ϵ^2 μS p1[t, a] × p2[t, a] p3[t, a]^2 p1^(1,0)[t, a] +
 8 kE kI^2 δ ϵ p2[t, a] p3[t, a]^3 yE[t, a] p1^(1,0)[t, a] -
 8 kE^2 kI ϵ p2[t, a] p3[t, a]^3 yI[t, a] p1^(1,0)[t, a] -
 8 kE^2 kI^2 ϵ^2 p2[t, a] p3[t, a]^2 p1^(0,1)[t, a] p1^(1,0)[t, a] +
 8 kE^2 kI^2 ϵ^2 p1[t, a] × p2[t, a] × p3[t, a] p3^(0,1)[t, a] p1^(1,0)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] p3[t, a]^2 p1^(1,0)[t, a]^2 +
 4 kE^2 kI^2 ϵ^2 μS p2[t, a] p3[t, a]^2 p2^(1,0)[t, a] +
 2 kE^2 kI^2 ϵ^2 p3[t, a]^2 p2^(0,1)[t, a] p2^(1,0)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] × p3[t, a] p3^(0,1)[t, a] p2^(1,0)[t, a] +
 kE^2 kI^2 ϵ^2 p3[t, a]^2 p2^(1,0)[t, a]^2 +
 8 kE^2 kI^2 ϵ^2 μS p1[t, a]^2 p2[t, a] × p3[t, a] p3^(1,0)[t, a] -
 8 kE^2 kI^2 ϵ^2 μS p2[t, a]^2 p3[t, a] p3^(1,0)[t, a] -
 8 kE kI^2 δ ϵ p1[t, a] × p2[t, a] p3[t, a]^2 yE[t, a] p3^(1,0)[t, a] +
 8 kE^2 kI ϵ p1[t, a] × p2[t, a] p3[t, a]^2 yI[t, a] p3^(1,0)[t, a] +
 8 kE^2 kI^2 ϵ^2 p1[t, a] × p2[t, a] × p3[t, a] p1^(0,1)[t, a] p3^(1,0)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] × p3[t, a] p2^(0,1)[t, a] p3^(1,0)[t, a] -
 8 kE^2 kI^2 ϵ^2 p1[t, a]^2 p2[t, a] p3^(0,1)[t, a] p3^(1,0)[t, a] +
 8 kE^2 kI^2 ϵ^2 p2[t, a]^2 p3^(0,1)[t, a] p3^(1,0)[t, a] +
 8 kE^2 kI^2 ϵ^2 p1[t, a] × p2[t, a] × p3[t, a] p1^(1,0)[t, a] p3^(1,0)[t, a] -
 4 kE^2 kI^2 ϵ^2 p2[t, a] × p3[t, a] p2^(1,0)[t, a] p3^(1,0)[t, a] -
 4 kE^2 kI^2 ϵ^2 p1[t, a]^2 p2[t, a] p3^(1,0)[t, a]^2 + 4 kE^2 kI^2 ϵ^2 p2[t, a]^2 p3^(1,0)[t, a]^2
```

In[∘]:=

```
(* BIG NOTE!! The next bit is not automated,
so if you change stuff above, you'll need to redo this! *)
```

In[∘]:=

```
p1[t, a] = -kE kI^2 δ ϵ μI yE[t, a] - kE kI^2 δ ϵ μS yE[t, a] +
  kE^2 kI ϵ μI yI[t, a] + kE^2 kI ϵ μS yI[t, a] - kE kI^2 δ ϵ yE^(0,1)[t, a] +
  kE^2 kI ϵ yI^(0,1)[t, a] - kE kI^2 δ ϵ yE^(1,0)[t, a] + kE^2 kI ϵ yI^(1,0)[t, a]
p2[t, a] = -4 kE^2 kI β ϵ^2 yI[t, a]
   (-kI^2 δ^2 yE[t, a]^2 + 2 kE kI δ yE[t, a] × yI[t, a] - kE^2 yI[t, a]^2) +
  (kE kI^2 δ ϵ μI yE[t, a] + kE kI^2 δ ϵ μS yE[t, a] - kE^2 kI ϵ μI yI[t, a] -
     kE^2 kI ϵ μS yI[t, a] + kE kI^2 δ ϵ yE^(0,1)[t, a] - kE^2 kI ϵ yI^(0,1)[t, a] +
     kE kI^2 δ ϵ yE^(1,0)[t, a] - kE^2 kI ϵ yI^(1,0)[t, a])^2
p3[t, a] = 2 kE^2 kI β ϵ^2 yI[t, a]
```

Out[∘]=

```
-kE kI^2 δ ϵ μI yE[t, a] - kE kI^2 δ ϵ μS yE[t, a] + kE^2 kI ϵ μI yI[t, a] + kE^2 kI ϵ μS yI[t, a] -
 kE kI^2 δ ϵ yE^(0,1)[t, a] + kE^2 kI ϵ yI^(0,1)[t, a] - kE kI^2 δ ϵ yE^(1,0)[t, a] + kE^2 kI ϵ yI^(1,0)[t, a]
```

Out[∘]=

```
-4 kE^2 kI β ϵ^2 yI[t, a] (-kI^2 δ^2 yE[t, a]^2 + 2 kE kI δ yE[t, a] × yI[t, a] - kE^2 yI[t, a]^2) +
  (kE kI^2 δ ϵ μI yE[t, a] + kE kI^2 δ ϵ μS yE[t, a] -
     kE^2 kI ϵ μI yI[t, a] - kE^2 kI ϵ μS yI[t, a] + kE kI^2 δ ϵ yE^(0,1)[t, a] -
     kE^2 kI ϵ yI^(0,1)[t, a] + kE kI^2 δ ϵ yE^(1,0)[t, a] - kE^2 kI ϵ yI^(1,0)[t, a])^2
```

Out[∘]=

```
2 kE^2 kI β ϵ^2 yI[t, a]
```

In[∘]:=

```
p1^(1,0)[t, a] = D[p1[t, a], t]
p1^(0,1)[t, a] = D[p1[t, a], a]
p2^(1,0)[t, a] = D[p2[t, a], t]
p2^(0,1)[t, a] = D[p2[t, a], a]
p3^(1,0)[t, a] = D[p3[t, a], t]
p3^(0,1)[t, a] = D[p3[t, a], a]
```

Out[∘]= $-kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE^{(1,0)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE^{(1,0)}[t,a] + kE^2\,kI\,\epsilon\,\mu I\,yI^{(1,0)}[t,a] + kE^2\,kI\,\epsilon\,\mu S\,yI^{(1,0)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,yE^{(1,1)}[t,a] + kE^2\,kI\,\epsilon\,yI^{(1,1)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,yE^{(2,0)}[t,a] + kE^2\,kI\,\epsilon\,yI^{(2,0)}[t,a]$

Out[∘]= $-kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE^{(0,1)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE^{(0,1)}[t,a] + kE^2\,kI\,\epsilon\,\mu I\,yI^{(0,1)}[t,a] + kE^2\,kI\,\epsilon\,\mu S\,yI^{(0,1)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,yE^{(0,2)}[t,a] + kE^2\,kI\,\epsilon\,yI^{(0,2)}[t,a] - kE\,kI^2\,\delta\,\epsilon\,yE^{(1,1)}[t,a] + kE^2\,kI\,\epsilon\,yI^{(1,1)}[t,a]$

Out[∘]= $-4\,kE^2\,kI\,\beta\,\epsilon^2\left(-kI^2\,\delta^2\,yE[t,a]^2 + 2\,kE\,kI\,\delta\,yE[t,a]\times yI[t,a] - kE^2\,yI[t,a]^2\right)yI^{(1,0)}[t,a] - 4\,kE^2\,kI\,\beta\,\epsilon^2\,yI[t,a]\left(-2\,kI^2\,\delta^2\,yE[t,a]\,yE^{(1,0)}[t,a] + 2\,kE\,kI\,\delta\,yI[t,a]\,yE^{(1,0)}[t,a] + 2\,kE\,kI\,\delta\,yE[t,a]\,yI^{(1,0)}[t,a] - 2\,kE^2\,yI[t,a]\,yI^{(1,0)}[t,a]\right) + 2\left(kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE[t,a] + kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE[t,a] - kE^2\,kI\,\epsilon\,\mu I\,yI[t,a] - kE^2\,kI\,\epsilon\,\mu S\,yI[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(0,1)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(0,1)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(1,0)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(1,0)}[t,a]\right)\left(kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE^{(1,0)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE^{(1,0)}[t,a] - kE^2\,kI\,\epsilon\,\mu I\,yI^{(1,0)}[t,a] - kE^2\,kI\,\epsilon\,\mu S\,yI^{(1,0)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(1,1)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(1,1)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(2,0)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(2,0)}[t,a]\right)$

Out[∘]= $-4\,kE^2\,kI\,\beta\,\epsilon^2\left(-kI^2\,\delta^2\,yE[t,a]^2 + 2\,kE\,kI\,\delta\,yE[t,a]\times yI[t,a] - kE^2\,yI[t,a]^2\right)yI^{(0,1)}[t,a] - 4\,kE^2\,kI\,\beta\,\epsilon^2\,yI[t,a]\left(-2\,kI^2\,\delta^2\,yE[t,a]\,yE^{(0,1)}[t,a] + 2\,kE\,kI\,\delta\,yI[t,a]\,yE^{(0,1)}[t,a] + 2\,kE\,kI\,\delta\,yE[t,a]\,yI^{(0,1)}[t,a] - 2\,kE^2\,yI[t,a]\,yI^{(0,1)}[t,a]\right) + 2\left(kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE[t,a] + kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE[t,a] - kE^2\,kI\,\epsilon\,\mu I\,yI[t,a] - kE^2\,kI\,\epsilon\,\mu S\,yI[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(0,1)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(0,1)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(1,0)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(1,0)}[t,a]\right)\left(kE\,kI^2\,\delta\,\epsilon\,\mu I\,yE^{(0,1)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,\mu S\,yE^{(0,1)}[t,a] - kE^2\,kI\,\epsilon\,\mu I\,yI^{(0,1)}[t,a] - kE^2\,kI\,\epsilon\,\mu S\,yI^{(0,1)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(0,2)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(0,2)}[t,a] + kE\,kI^2\,\delta\,\epsilon\,yE^{(1,1)}[t,a] - kE^2\,kI\,\epsilon\,yI^{(1,1)}[t,a]\right)$

Out[∘]= $2\,kE^2\,kI\,\beta\,\epsilon^2\,yI^{(1,0)}[t,a]$

Out[∘]= $2\,kE^2\,kI\,\beta\,\epsilon^2\,yI^{(0,1)}[t,a]$

In[∘]:=
```
s2thing2[t, a]
```

Out[∘]=
```
-64 kE^8 kI^6 β^4 δ^2 ϵ^8 yE[t, a]^2 yI[t, a]^4
  (-4 kE^2 kI β ϵ^2 yI[t, a] (-kI^2 δ^2 yE[t, a]^2 + 2 kE kI δ yE[t, a] × yI[t, a] -
      kE^2 yI[t, a]^2) + (kE kI^2 δ ϵ μI yE[t, a] + ... 8 ... +
      kE kI^2 δ ϵ yE^(... 1 ...)[t, a] - kE^2 kI ϵ yI^(1,0)[t, a])^2) + ... 62 ... +
 4 kE^6 kI^4 β^2 ϵ^6 yI[t, a]^2 (-4 kE^2 ... 4 ... yI^(... 1 ...)[t, a] - ... 1 ... + ... 1 ...)^2
```

large output | show less | show more | show all | set size limit...

In[∘]:=
```
Coefficient[s2thing2[t, a], S[t, a]]
Coefficient[s2thing2[t, a], D[S[t, a], t]]
Coefficient[s2thing2[t, a], D[S[t, a], a]]
Coefficient[s2thing2[t, a], EE[t, a]]
Coefficient[s2thing2[t, a], D[EE[t, a], t]]
Coefficient[s2thing2[t, a], D[EE[t, a], a]]
```

Out[∘]= 0

Out[∘]= 0

Out[∘]= 0

Out[∘]= 0

Out[∘]= 0

Out[∘]= 0

In[∘]:=
```
IPOPish1[t_, a_] = Denominator[Together[s2thing2[t, a]]] × Together[s2thing2[t, a]]
IPOPish2[t_, a_] = Denominator[Together[dEEdteqn3[t, a]]] × Together[dEEdteqn3[t, a]]
```

Out[∘]=
```
-64 (kE^10 kI^11 β^3 δ^4 ϵ^10 μI^3 μS yE[t, a]^4 yI[t, a]^3 +
    2 kE^10 kI^11 β^3 δ^4 ϵ^10 μI^2 μS^2 yE[t, a]^4 yI[t, a]^3 +
    ... 1333 ... + kE^14 kI^7 β^3 ϵ^10 yI[t, a]^5 yI^(2,0)[t, a]^2)
```

large output | show less | show more | show all | set size limit...

Out[∘]=
```
-kI δ yE[t, a] - kI ϵ μE yE[t, a] + kE yI[t, a] -
 kE ϵ yI[t, a] - kI ϵ yE^(0,1)[t, a] - kI ϵ yE^(1,0)[t, a]
```

In[∘]:=
```
Monos1 = Sort[MonomialList[IPOPish1[t, a], {yI[t, a], D[yI[t, a], t], D[yI[t, a], a],
    D[yI[t, a], t, a], D[yI[t, a], {t, 2}], D[yI[t, a], {a, 2}], D[yE[t, a], t],
    D[yE[t, a], a], D[yE[t, a], t, a], D[yE[t, a], {t, 2}], D[yE[t, a], {a, 2}]}]]
Monos2 = Sort[MonomialList[IPOPish2[t, a], {yI[t, a], D[yI[t, a], t], D[yI[t, a], a],
    D[yI[t, a], t, a], D[yI[t, a], {t, 2}], D[yI[t, a], {a, 2}], D[yE[t, a], t],
    D[yE[t, a], a], D[yE[t, a], t, a], D[yE[t, a], {t, 2}], D[yE[t, a], {a, 2}]}]]
```

Out[∘]=

$$\{(-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^3\,\mu S\,yE[t,a]^4 - 128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2\,\mu S^2\,yE[t,a]^4 - 64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S^3\,yE[t,a]^4)\,yI[t,a]^3,$$

… 529 …, $-64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,yI[t,a]^5\,yI^{(2,0)}[t,a]^2\}$

large output | show less | show more | show all | set size limit...

Out[∘]=

$$\{-kI\,\delta\,yE[t,a] - kI\,\epsilon\,\mu E\,yE[t,a],\ (kE - kE\,\epsilon)\,yI[t,a],\ -kI\,\epsilon\,yE^{(0,1)}[t,a],\ -kI\,\epsilon\,yE^{(1,0)}[t,a]\}$$

In[∘]:=
```
MonicMonos1 =
 Monos1 / (Last[Monos1] /. {yI[t, a] → 1, D[yI[t, a], t] → 1, D[yI[t, a], a] → 1,
    D[yI[t, a], t, a] → 1, D[yI[t, a], {t, 2}] → 1, D[yI[t, a], {a, 2}] → 1,
    yE[t, a] → 1, D[yE[t, a], t] → 1, D[yE[t, a], a] → 1,
    D[yE[t, a], t, a] → 1, D[yE[t, a], {t, 2}] → 1, D[yE[t, a], {a, 2}] → 1})
MonicMonos2 = Monos2 / (Last[Monos2] /. {yI[t, a] → 1, D[yI[t, a], t] → 1,
    D[yI[t, a], a] → 1, D[yI[t, a], t, a] → 1, D[yI[t, a], {t, 2}] → 1,
    D[yI[t, a], {a, 2}] → 1, yE[t, a] → 1, D[yE[t, a], t] → 1, D[yE[t, a], a] → 1,
    D[yE[t, a], t, a] → 1, D[yE[t, a], {t, 2}] → 1, D[yE[t, a], {a, 2}] → 1})
```

Out[∘]=

$$\{-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}(-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^3\,\mu S\,yE[t,a]^4 - 128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2\,\mu S^2\,yE[t,a]^4 - 64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S^3\,yE[t,a]^4)\,yI[t,a]^3,$$

… 529 …, $yI[t,a]^5\,yI^{(2,0)}[t,a]^2\}$

large output | show less | show more | show all | set size limit...

Out[∘]=

$$\{-\frac{-kI\,\delta\,yE[t,a] - kI\,\epsilon\,\mu E\,yE[t,a]}{kI\,\epsilon},\ -\frac{(kE - kE\,\epsilon)\,yI[t,a]}{kI\,\epsilon},\ yE^{(0,1)}[t,a],\ yE^{(1,0)}[t,a]\}$$

In[•]:=
```
Coeffs1 = MonicMonos1 /. {yI[t, a] → 1, D[yI[t, a], t] → 1,
   D[yI[t, a], a] → 1, D[yI[t, a], t, a] → 1, D[yI[t, a], {t, 2}] → 1,
   D[yI[t, a], {a, 2}] → 1, yE[t, a] → 1, D[yE[t, a], t] → 1, D[yE[t, a], a] → 1,
   D[yE[t, a], t, a] → 1, D[yE[t, a], {t, 2}] → 1, D[yE[t, a], {a, 2}] → 1}
Coeffs2 = MonicMonos2 /. {yI[t, a] → 1, D[yI[t, a], t] → 1, D[yI[t, a], a] → 1,
   D[yI[t, a], t, a] → 1, D[yI[t, a], {t, 2}] → 1, D[yI[t, a], {a, 2}] → 1,
   yE[t, a] → 1, D[yE[t, a], t] → 1, D[yE[t, a], a] → 1,
   D[yE[t, a], t, a] → 1, D[yE[t, a], {t, 2}] → 1, D[yE[t, a], {a, 2}] → 1}
```

Out[•]=

$$\left\{-\frac{-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^3\,\mu S-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2\,\mu S^2-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S^3}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},\ \cdots 529 \cdots,\ 1\right\}$$

large output | show less | show more | show all | set size limit...

Out[•]=

$$\left\{-\frac{-kI\,\delta-kI\,\epsilon\,\mu E}{kI\,\epsilon},\ -\frac{kE-kE\,\epsilon}{kI\,\epsilon},\ 1,\ 1\right\}$$

In[•]:=
```
Coeffs = Union[Coeffs1, Coeffs2]
```

Out[•]=

$$\left\{-8,\ -4,\ -2,\ 1,\ 2,\ 4,\ 6,\ -\frac{8\,\beta}{kI},\ -\frac{4\,\beta}{kI},\ \frac{4\,\beta}{kI},\ \frac{8\,\beta}{kI},\ \frac{4\,\beta^2}{kI^2},\ -\frac{9\,kI\,\delta}{kE},\ -\frac{8\,kI\,\delta}{kE},\ -\frac{6\,kI\,\delta}{kE},\ -\frac{4\,kI\,\delta}{kE},\right.$$

$$-\frac{3\,kI\,\delta}{kE},\ -\frac{2\,kI\,\delta}{kE},\ -\frac{kI\,\delta}{kE},\ \frac{2\,kI\,\delta}{kE},\ \frac{3\,kI\,\delta}{kE},\ \frac{4\,kI\,\delta}{kE},\ \frac{6\,kI\,\delta}{kE},\ \frac{8\,kI\,\delta}{kE},\ \frac{12\,kI\,\delta}{kE},\ -\frac{8\,\beta\,\delta}{kE},$$

$$-\frac{4\,\beta\,\delta}{kE},\ \frac{6\,\beta\,\delta}{kE},\ -\frac{12\,kI^2\,\delta^2}{kE^2},\ -\frac{8\,kI^2\,\delta^2}{kE^2},\ -\frac{6\,kI^2\,\delta^2}{kE^2},\ -\frac{4\,kI^2\,\delta^2}{kE^2},\ -\frac{3\,kI^2\,\delta^2}{kE^2},\ -\frac{2\,kI^2\,\delta^2}{kE^2},$$

$$-\frac{kI^2\,\delta^2}{kE^2},\ \frac{kI^2\,\delta^2}{kE^2},\ \frac{2\,kI^2\,\delta^2}{kE^2},\ \frac{3\,kI^2\,\delta^2}{kE^2},\ \frac{4\,kI^2\,\delta^2}{kE^2},\ \frac{6\,kI^2\,\delta^2}{kE^2},\ \frac{8\,kI^2\,\delta^2}{kE^2},\ \frac{9\,kI^2\,\delta^2}{kE^2},\ \frac{12\,kI^2\,\delta^2}{kE^2},$$

$$\frac{16\,kI^2\,\delta^2}{kE^2},\ -\frac{6\,kI\,\beta\,\delta^2}{kE^2},\ -\frac{3\,kI\,\beta\,\delta^2}{kE^2},\ -\frac{12\,kI^3\,\delta^3}{kE^3},\ -\frac{8\,kI^3\,\delta^3}{kE^3},\ -\frac{6\,kI^3\,\delta^3}{kE^3},\ -\frac{4\,kI^3\,\delta^3}{kE^3},\ -\frac{3\,kI^3\,\delta^3}{kE^3},$$

$$-\frac{2\,kI^3\,\delta^3}{kE^3},\ -\frac{kI^3\,\delta^3}{kE^3},\ \frac{kI^3\,\delta^3}{kE^3},\ \frac{2\,kI^3\,\delta^3}{kE^3},\ \frac{4\,kI^3\,\delta^3}{kE^3},\ \frac{8\,kI^3\,\delta^3}{kE^3},\ -\frac{4\,kI^4\,\delta^4}{kE^4},\ -\frac{2\,kI^4\,\delta^4}{kE^4},$$

$$-\frac{kI^4\,\delta^4}{kE^4},\ \frac{kI^4\,\delta^4}{kE^4},\ \frac{2\,kI^4\,\delta^4}{kE^4},\ \frac{3\,kI^4\,\delta^4}{kE^4},\ \frac{4\,kI^4\,\delta^4}{kE^4},\ -\frac{kE-kE\,\epsilon}{kI\,\epsilon},\ -\frac{-kI\,\delta-kI\,\epsilon\,\mu E}{kI\,\epsilon},\ \frac{kI\,\delta\,\mu I}{kE},$$

$$\frac{3\,kI\,\delta\,\mu I}{kE},\ \frac{kI^2\,\delta^2\,\mu S}{kE^2},\ \frac{3\,kI^2\,\delta^2\,\mu S}{kE^2},\ -\frac{4\,kI^3\,\delta^3\,\mu S}{kE^3},\ -\frac{2\,kI^3\,\delta^3\,\mu S}{kE^3},\ \frac{kI^4\,\delta^4\,\mu S}{kE^4},\ \frac{2\,kI^4\,\delta^4\,\mu S}{kE^4},$$

$$-\frac{-128\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I-128\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},\ -\frac{-64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I-64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I+64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},\ -\frac{192\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I+192\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$\left.-\frac{-128\,kE^{14}\,kI^6\,\beta^4\,\epsilon^{10}\,\mu I-128\,kE^{14}\,kI^6\,\beta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},\right.$$

$$-\frac{-384\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I-512\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-192\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I-256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{64\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I+64\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I+128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I+256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{384\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}\,\mu I+128\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-512\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I-512\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-256\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I-256\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I-128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I-64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+256\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+320\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I+640\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-384\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I-512\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-192\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I-384\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-192\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I-256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I-128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-64\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I-128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-64\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I-64\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I+128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I+256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{512\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I+512\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-256\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I-256\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I+64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I+128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I+128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{192\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I+384\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{128\,kE^{10}\,kI^{10}\,\beta^4\,\delta^4\,\epsilon^{10}-256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^2-256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{64\,kE^{10}\,kI^{10}\,\beta^4\,\delta^4\,\epsilon^{10}-128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^2-128\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2+128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(1536\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}-128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I^{2}-256\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I\,\mu S-128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{768\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}-64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I^{2}-128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I\,\mu S-64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-640\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}+64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I^{2}+64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-1280\,kE^{13}\,kI^{7}\,\beta^{4}\,\delta\,\epsilon^{10}+128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I^{2}+128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1024\,kE^{13}\,kI^{6}\,\beta^{5}\,\delta\,\epsilon^{10}-64\,kE^{14}\,kI^{6}\,\beta^{4}\,\epsilon^{10}\,\mu I^{2}-384\,kE^{14}\,kI^{6}\,\beta^{4}\,\epsilon^{10}\,\mu I\,\mu S-64\,kE^{14}\,kI^{6}\,\beta^{4}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(1152\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}-512\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}-512\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S-256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{768\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}-128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},\ -\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(576\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}-256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}-256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S-128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-768\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}+64\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}+128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),\ -\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-1536\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}+128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}+256\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-768\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}+192\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}+384\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S+192\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-1536\,kE^{12}\,kI^{8}\,\beta^{4}\,\delta^{2}\,\epsilon^{10}+384\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I^{2}+768\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu I\,\mu S+384\,kE^{13}\,kI^{8}\,\beta^{3}\,\delta\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(512\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-768\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(1536\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-768\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(256\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S-192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(768\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-384\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S-192\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-384\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-256\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}+320\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}+320\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-768\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}-128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}-128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-512\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}+640\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}+640\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-384\,kE^{11}\,kI^{9}\,\beta^{4}\,\delta^{3}\,\epsilon^{10}+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I^{2}+128\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu I\,\mu S+256\,kE^{12}\,kI^{9}\,\beta^{3}\,\delta^{2}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(384\,kE^{10}\,kI^{10}\,\beta^{4}\,\delta^{4}\,\epsilon^{10}+256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S-256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{-256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}-256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S-128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(192\,kE^{10}\,kI^{10}\,\beta^{4}\,\delta^{4}\,\epsilon^{10}+128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S-128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{64\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+256\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-256\,kE^{10}\,kI^{10}\,\beta^{4}\,\delta^{4}\,\epsilon^{10}+192\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+384\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S+192\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}}\left(-512\,kE^{10}\,kI^{10}\,\beta^{4}\,\delta^{4}\,\epsilon^{10}+384\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I^{2}+768\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu I\,\mu S+384\,kE^{11}\,kI^{10}\,\beta^{3}\,\delta^{3}\,\epsilon^{10}\,\mu S^{2}\right),$$

$$-\frac{-128\,kE^{10}\,kI^{11}\,\beta^{3}\,\delta^{4}\,\epsilon^{10}\,\mu I^{2}-256\,kE^{10}\,kI^{11}\,\beta^{3}\,\delta^{4}\,\epsilon^{10}\,\mu I\,\mu S-128\,kE^{10}\,kI^{11}\,\beta^{3}\,\delta^{4}\,\epsilon^{10}\,\mu S^{2}}{64\,kE^{14}\,kI^{7}\,\beta^{3}\,\epsilon^{10}},$$

$$-\frac{-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S^2}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S+64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S^2}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2-128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S+128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu S^2}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(128\,kE^{13}\,kI^7\,\beta^4\,\delta\,\epsilon^{10}\,\mu I+384\,kE^{13}\,kI^7\,\beta^4\,\delta\,\epsilon^{10}\,\mu S-128\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I^2\,\mu S-128\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(-1152\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu I+64\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I^3-384\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu S+256\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I^2\,\mu S+192\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(384\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu I-64\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I^3-384\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu S+256\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I^2\,\mu S+320\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(1152\,kE^{11}\,kI^9\,\beta^4\,\delta^3\,\epsilon^{10}\,\mu I-192\,kE^{12}\,kI^9\,\beta^3\,\delta^2\,\epsilon^{10}\,\mu I^3+384\,kE^{11}\,kI^9\,\beta^4\,\delta^3\,\epsilon^{10}\,\mu S-768\,kE^{12}\,kI^9\,\beta^3\,\delta^2\,\epsilon^{10}\,\mu I^2\,\mu S-576\,kE^{12}\,kI^9\,\beta^3\,\delta^2\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(-640\,kE^{11}\,kI^9\,\beta^4\,\delta^3\,\epsilon^{10}\,\mu I+192\,kE^{12}\,kI^9\,\beta^3\,\delta^2\,\epsilon^{10}\,\mu I^3+128\,kE^{11}\,kI^9\,\beta^4\,\delta^3\,\epsilon^{10}\,\mu S-192\,kE^{12}\,kI^9\,\beta^3\,\delta^2\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(256\,kE^{10}\,kI^{10}\,\beta^4\,\delta^4\,\epsilon^{10}\,\mu I-192\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^3-256\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^2\,\mu S-64\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(-384\,kE^{10}\,kI^{10}\,\beta^4\,\delta^4\,\epsilon^{10}\,\mu I+192\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^3-128\,kE^{10}\,kI^{10}\,\beta^4\,\delta^4\,\epsilon^{10}\,\mu S+768\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I^2\,\mu S+576\,kE^{11}\,kI^{10}\,\beta^3\,\delta^3\,\epsilon^{10}\,\mu I\,\mu S^2\right),$$

$$-\frac{-64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^3-256\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2\,\mu S-192\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S^2}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^3+128\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I^2\,\mu S+64\,kE^{10}\,kI^{11}\,\beta^3\,\delta^4\,\epsilon^{10}\,\mu I\,\mu S^2}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}},$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(-1536\,kE^{12}\,kI^7\,\beta^5\,\delta^2\,\epsilon^{10}+256\,kE^{13}\,kI^7\,\beta^4\,\delta\,\epsilon^{10}\,\mu I^2+1536\,kE^{13}\,kI^7\,\beta^4\,\delta\,\epsilon^{10}\,\mu I\,\mu S-64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I^3\,\mu S+256\,kE^{13}\,kI^7\,\beta^4\,\delta\,\epsilon^{10}\,\mu S^2-128\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I^2\,\mu S^2-64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}\,\mu I\,\mu S^3\right),$$

$$-\frac{1}{64\,kE^{14}\,kI^7\,\beta^3\,\epsilon^{10}}\left(1024\,kE^{11}\,kI^8\,\beta^5\,\delta^3\,\epsilon^{10}-384\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu I^2-2304\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu I\,\mu S+256\,kE^{13}\,kI^8\,\beta^3\,\delta\,\epsilon^{10}\,\mu I^3\,\mu S-384\,kE^{12}\,kI^8\,\beta^4\,\delta^2\,\epsilon^{10}\,\mu S^2+\right.$$

$$512\, kE^{13}\, kI^{8}\, \beta^{3}\, \delta\, \epsilon^{10}\, \mu I^{2}\, \mu S^{2} + 256\, kE^{13}\, kI^{8}\, \beta^{3}\, \delta\, \epsilon^{10}\, \mu I\, \mu S^{3}\Big),$$

$$-\frac{1}{64\, kE^{14}\, kI^{7}\, \beta^{3}\, \epsilon^{10}}\Big(-256\, kE^{10}\, kI^{9}\, \beta^{5}\, \delta^{4}\, \epsilon^{10} + 256\, kE^{11}\, kI^{9}\, \beta^{4}\, \delta^{3}\, \epsilon^{10}\, \mu I^{2} + 1536\, kE^{11}\, kI^{9}\, \beta^{4}\, \delta^{3}\, \epsilon^{10}\, \mu I\, \mu S - 384\, kE^{12}\, kI^{9}\, \beta^{3}\, \delta^{2}\, \epsilon^{10}\, \mu I^{3}\, \mu S + 256\, kE^{11}\, kI^{9}\, \beta^{4}\, \delta^{3}\, \epsilon^{10}\, \mu S^{2} - 768\, kE^{12}\, kI^{9}\, \beta^{3}\, \delta^{2}\, \epsilon^{10}\, \mu I^{2}\, \mu S^{2} - 384\, kE^{12}\, kI^{9}\, \beta^{3}\, \delta^{2}\, \epsilon^{10}\, \mu I\, \mu S^{3}\Big),$$

$$-\frac{1}{64\, kE^{14}\, kI^{7}\, \beta^{3}\, \epsilon^{10}}\Big(-64\, kE^{10}\, kI^{10}\, \beta^{4}\, \delta^{4}\, \epsilon^{10}\, \mu I^{2} - 384\, kE^{10}\, kI^{10}\, \beta^{4}\, \delta^{4}\, \epsilon^{10}\, \mu I\, \mu S + 256\, kE^{11}\, kI^{10}\, \beta^{3}\, \delta^{3}\, \epsilon^{10}\, \mu I^{3}\, \mu S - 64\, kE^{10}\, kI^{10}\, \beta^{4}\, \delta^{4}\, \epsilon^{10}\, \mu S^{2} + 512\, kE^{11}\, kI^{10}\, \beta^{3}\, \delta^{3}\, \epsilon^{10}\, \mu I^{2}\, \mu S^{2} + 256\, kE^{11}\, kI^{10}\, \beta^{3}\, \delta^{3}\, \epsilon^{10}\, \mu I\, \mu S^{3}\Big),$$

$$-\frac{-64\, kE^{10}\, kI^{11}\, \beta^{3}\, \delta^{4}\, \epsilon^{10}\, \mu I^{3}\, \mu S - 128\, kE^{10}\, kI^{11}\, \beta^{3}\, \delta^{4}\, \epsilon^{10}\, \mu I^{2}\, \mu S^{2} - 64\, kE^{10}\, kI^{11}\, \beta^{3}\, \delta^{4}\, \epsilon^{10}\, \mu I\, \mu S^{3}}{64\, kE^{14}\, kI^{7}\, \beta^{3}\, \epsilon^{10}}\Big\}$$

In[∘]:=
```
xCoeffs =
Coeffs /. {β → a1, δ → a2, ϵ → a3, μS → a4, μE → a5, μI → a6, c → a7, kE → a8, kI → a9}
```

Out[∘]=

$$\Big\{-8, -4, -2, 1, 2, 4, 6, -\frac{8\, a1}{a9}, -\frac{4\, a1}{a9}, \frac{4\, a1}{a9}, \frac{8\, a1}{a9}, \frac{4\, a1^{2}}{a9^{2}}, -\frac{9\, a2\, a9}{a8}, -\frac{8\, a2\, a9}{a8}, -\frac{6\, a2\, a9}{a8},$$

$$-\frac{4\, a2\, a9}{a8}, -\frac{3\, a2\, a9}{a8}, -\frac{2\, a2\, a9}{a8}, -\frac{a2\, a9}{a8}, \frac{2\, a2\, a9}{a8}, \frac{3\, a2\, a9}{a8}, \frac{4\, a2\, a9}{a8}, \frac{6\, a2\, a9}{a8}, \frac{8\, a2\, a9}{a8},$$

$$\frac{12\, a2\, a9}{a8}, -\frac{8\, a1\, a2}{a8}, -\frac{4\, a1\, a2}{a8}, \frac{6\, a1\, a2}{a8}, -\frac{12\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{8\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{6\, a2^{2}\, a9^{2}}{a8^{2}},$$

$$-\frac{4\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{3\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{2\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{a2^{2}\, a9^{2}}{a8^{2}}, \frac{a2^{2}\, a9^{2}}{a8^{2}}, \frac{2\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{3\, a2^{2}\, a9^{2}}{a8^{2}},$$

$$\frac{4\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{6\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{8\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{9\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{12\, a2^{2}\, a9^{2}}{a8^{2}}, \frac{16\, a2^{2}\, a9^{2}}{a8^{2}}, -\frac{6\, a1\, a2^{2}\, a9}{a8^{2}},$$

$$-\frac{3\, a1\, a2^{2}\, a9}{a8^{2}}, -\frac{12\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{8\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{6\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{4\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{3\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{2\, a2^{3}\, a9^{3}}{a8^{3}},$$

$$-\frac{a2^{3}\, a9^{3}}{a8^{3}}, \frac{a2^{3}\, a9^{3}}{a8^{3}}, \frac{2\, a2^{3}\, a9^{3}}{a8^{3}}, \frac{4\, a2^{3}\, a9^{3}}{a8^{3}}, \frac{8\, a2^{3}\, a9^{3}}{a8^{3}}, -\frac{4\, a2^{4}\, a9^{4}}{a8^{4}}, -\frac{2\, a2^{4}\, a9^{4}}{a8^{4}},$$

$$-\frac{a2^{4}\, a9^{4}}{a8^{4}}, \frac{a2^{4}\, a9^{4}}{a8^{4}}, \frac{2\, a2^{4}\, a9^{4}}{a8^{4}}, \frac{3\, a2^{4}\, a9^{4}}{a8^{4}}, \frac{4\, a2^{4}\, a9^{4}}{a8^{4}}, -\frac{a8 - a3\, a8}{a3\, a9}, -\frac{-a2\, a9 - a3\, a5\, a9}{a3\, a9},$$

$$\frac{a2\, a6\, a9}{a8}, \frac{3\, a2\, a6\, a9}{a8}, \frac{a2^{2}\, a4\, a9^{2}}{a8^{2}}, \frac{3\, a2^{2}\, a4\, a9^{2}}{a8^{2}}, -\frac{4\, a2^{3}\, a4\, a9^{3}}{a8^{3}}, -\frac{2\, a2^{3}\, a4\, a9^{3}}{a8^{3}},$$

$$\frac{a2^{4}\, a4\, a9^{4}}{a8^{4}}, \frac{2\, a2^{4}\, a4\, a9^{4}}{a8^{4}}, -\frac{-128\, a1^{3}\, a3^{10}\, a4\, a8^{14}\, a9^{7} - 128\, a1^{3}\, a3^{10}\, a6\, a8^{14}\, a9^{7}}{64\, a1^{3}\, a3^{10}\, a8^{14}\, a9^{7}},$$

$$-\frac{-64\, a1^{3}\, a3^{10}\, a4\, a8^{14}\, a9^{7} - 64\, a1^{3}\, a3^{10}\, a6\, a8^{14}\, a9^{7}}{64\, a1^{3}\, a3^{10}\, a8^{14}\, a9^{7}},$$

$$-\frac{64\, a1^{3}\, a3^{10}\, a4\, a8^{14}\, a9^{7} + 64\, a1^{3}\, a3^{10}\, a6\, a8^{14}\, a9^{7}}{64\, a1^{3}\, a3^{10}\, a8^{14}\, a9^{7}},$$

$$-\frac{192\, a1^{3}\, a3^{10}\, a4\, a8^{14}\, a9^{7} + 192\, a1^{3}\, a3^{10}\, a6\, a8^{14}\, a9^{7}}{64\, a1^{3}\, a3^{10}\, a8^{14}\, a9^{7}},$$

$$-\frac{-128\,a1^4\,a3^{10}\,a4\,a8^{14}\,a9^6-128\,a1^4\,a3^{10}\,a6\,a8^{14}\,a9^6}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-512\,a1^3\,a2\,a3^{10}\,a4\,a8^{13}\,a9^8-384\,a1^3\,a2\,a3^{10}\,a6\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-256\,a1^3\,a2\,a3^{10}\,a4\,a8^{13}\,a9^8-192\,a1^3\,a2\,a3^{10}\,a6\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{64\,a1^3\,a2\,a3^{10}\,a4\,a8^{13}\,a9^8+64\,a1^3\,a2\,a3^{10}\,a6\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2\,a3^{10}\,a4\,a8^{13}\,a9^8+128\,a1^3\,a2\,a3^{10}\,a6\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{256\,a1^3\,a2\,a3^{10}\,a4\,a8^{13}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a6\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^4\,a2\,a3^{10}\,a4\,a8^{13}\,a9^7+384\,a1^4\,a2\,a3^{10}\,a6\,a8^{13}\,a9^7}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-512\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9-512\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-256\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9-256\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-128\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9-128\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-64\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9-64\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{64\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+64\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+128\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+192\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{256\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+384\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{320\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+192\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{640\,a1^3\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^9+384\,a1^3\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^9}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-512\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-384\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-384\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-192\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-256\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-192\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-128\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-128\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-128\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-64\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-64\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}-64\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}+128\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{256\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{512\,a1^3\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^{10}+512\,a1^3\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-256\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}-256\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-128\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{64\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}+64\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}+64\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}+128\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{384\,a1^3\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{11}+192\,a1^3\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{64\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}-128\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}-128\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{11}+128\,a1^3\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(1536\,a1^4\,a2\,a3^{10}\,a8^{13}\,a9^7-128\,a1^3\,a3^{10}\,a4^2\,a8^{14}\,a9^7-256\,a1^3\,a3^{10}\,a4\,a6\,a8^{14}\,a9^7-128\,a1^3\,a3^{10}\,a6^2\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(768\,a1^4\,a2\,a3^{10}\,a8^{13}\,a9^7-64\,a1^3\,a3^{10}\,a4^2\,a8^{14}\,a9^7-128\,a1^3\,a3^{10}\,a4\,a6\,a8^{14}\,a9^7-64\,a1^3\,a3^{10}\,a6^2\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-640\,a1^4\,a2\,a3^{10}\,a8^{13}\,a9^7+64\,a1^3\,a3^{10}\,a4^2\,a8^{14}\,a9^7+64\,a1^3\,a3^{10}\,a4\,a6\,a8^{14}\,a9^7+64\,a1^3\,a3^{10}\,a6^2\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-1280\,a1^4\,a2\,a3^{10}\,a8^{13}\,a9^7+128\,a1^3\,a3^{10}\,a4^2\,a8^{14}\,a9^7+128\,a1^3\,a3^{10}\,a4\,a6\,a8^{14}\,a9^7+128\,a1^3\,a3^{10}\,a6^2\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(1024\,a1^5\,a2\,a3^{10}\,a8^{13}\,a9^6-64\,a1^4\,a3^{10}\,a4^2\,a8^{14}\,a9^6-384\,a1^4\,a3^{10}\,a4\,a6\,a8^{14}\,a9^6-64\,a1^4\,a3^{10}\,a6^2\,a8^{14}\,a9^6\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(1152\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8-256\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8-512\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8-512\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{768\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8-128\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(576\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8-128\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8-256\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8-256\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-768\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8+64\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8+128\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8+64\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-1536\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8+128\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8+128\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-768\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8+192\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8+384\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8+192\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-1536\,a1^4\,a2^2\,a3^{10}\,a8^{12}\,a9^8+384\,a1^3\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^8+768\,a1^3\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^8+384\,a1^3\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(512\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-768\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(1536\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-768\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(256\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(768\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-384\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9+64\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-64\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-64\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-256\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9+64\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9+320\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9+320\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-768\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9+128\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9-128\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9-128\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-512\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9+128\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9+640\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9+640\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-384\,a1^4\,a2^3\,a3^{10}\,a8^{11}\,a9^9+256\,a1^3\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^9+128\,a1^3\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^9+128\,a1^3\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(384\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}\right),$$

$$-\frac{-128\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(192\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}-128\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+128\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+128\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}\right),$$

$$-\frac{64\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+128\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+64\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+128\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-256\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}+192\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+384\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+192\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-512\,a1^4\,a2^4\,a3^{10}\,a8^{10}\,a9^{10}+384\,a1^3\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^{10}+768\,a1^3\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^{10}+384\,a1^3\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^{10}\right),$$

$$-\frac{-128\,a1^3\,a2^4\,a3^{10}\,a4^2\,a8^{10}\,a9^{11}-256\,a1^3\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{-64\,a1^3\,a2^4\,a3^{10}\,a4^2\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{11}-64\,a1^3\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{64\,a1^3\,a2^4\,a3^{10}\,a4^2\,a8^{10}\,a9^{11}-64\,a1^3\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{11}-64\,a1^3\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{128\,a1^3\,a2^4\,a3^{10}\,a4^2\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(384\,a1^4\,a2\,a3^{10}\,a4\,a8^{13}\,a9^7+128\,a1^4\,a2\,a3^{10}\,a6\,a8^{13}\,a9^7-128\,a1^3\,a3^{10}\,a4^2\,a6\,a8^{14}\,a9^7-128\,a1^3\,a3^{10}\,a4\,a6^2\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-384\,a1^4\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^8-1152\,a1^4\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^8+192\,a1^3\,a2\,a3^{10}\,a4^2\,a6\,a8^{13}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a4\,a6^2\,a8^{13}\,a9^8+64\,a1^3\,a2\,a3^{10}\,a6^3\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-384\,a1^4\,a2^2\,a3^{10}\,a4\,a8^{12}\,a9^8+384\,a1^4\,a2^2\,a3^{10}\,a6\,a8^{12}\,a9^8+320\,a1^3\,a2\,a3^{10}\,a4^2\,a6\,a8^{13}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a4\,a6^2\,a8^{13}\,a9^8-64\,a1^3\,a2\,a3^{10}\,a6^3\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(384\,a1^4\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^9+1152\,a1^4\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^9-576\,a1^3\,a2^2\,a3^{10}\,a4^2\,a6\,a8^{12}\,a9^9-768\,a1^3\,a2^2\,a3^{10}\,a4\,a6^2\,a8^{12}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a6^3\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(128\,a1^4\,a2^3\,a3^{10}\,a4\,a8^{11}\,a9^9-640\,a1^4\,a2^3\,a3^{10}\,a6\,a8^{11}\,a9^9-192\,a1^3\,a2^2\,a3^{10}\,a4^2\,a6\,a8^{12}\,a9^9+192\,a1^3\,a2^2\,a3^{10}\,a6^3\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(256\,a1^4\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{10}-64\,a1^3\,a2^3\,a3^{10}\,a4^2\,a6\,a8^{11}\,a9^{10}-256\,a1^3\,a2^3\,a3^{10}\,a4\,a6^2\,a8^{11}\,a9^{10}-192\,a1^3\,a2^3\,a3^{10}\,a6^3\,a8^{11}\,a9^{10}\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-128\,a1^4\,a2^4\,a3^{10}\,a4\,a8^{10}\,a9^{10}-384\,a1^4\,a2^4\,a3^{10}\,a6\,a8^{10}\,a9^{10}+576\,a1^3\,a2^3\,a3^{10}\,a4^2\,a6\,a8^{11}\,a9^{10}+768\,a1^3\,a2^3\,a3^{10}\,a4\,a6^2\,a8^{11}\,a9^{10}+192\,a1^3\,a2^3\,a3^{10}\,a6^3\,a8^{11}\,a9^{10}\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-192\,a1^3\,a2^4\,a3^{10}\,a4^2\,a6\,a8^{10}\,a9^{11}-256\,a1^3\,a2^4\,a3^{10}\,a4\,a6^2\,a8^{10}\,a9^{11}-64\,a1^3\,a2^4\,a3^{10}\,a6^3\,a8^{10}\,a9^{11}\right),$$

$$-\frac{64\,a1^3\,a2^4\,a3^{10}\,a4^2\,a6\,a8^{10}\,a9^{11}+128\,a1^3\,a2^4\,a3^{10}\,a4\,a6^2\,a8^{10}\,a9^{11}+64\,a1^3\,a2^4\,a3^{10}\,a6^3\,a8^{10}\,a9^{11}}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7},$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-1536\,a1^5\,a2^2\,a3^{10}\,a8^{12}\,a9^7+256\,a1^4\,a2\,a3^{10}\,a4^2\,a8^{13}\,a9^7+1536\,a1^4\,a2\,a3^{10}\,a4\,a6\,a8^{13}\,a9^7+256\,a1^4\,a2\,a3^{10}\,a6^2\,a8^{13}\,a9^7-64\,a1^3\,a3^{10}\,a4^3\,a6\,a8^{14}\,a9^7-128\,a1^3\,a3^{10}\,a4^2\,a6^2\,a8^{14}\,a9^7-64\,a1^3\,a3^{10}\,a4\,a6^3\,a8^{14}\,a9^7\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(1024\,a1^5\,a2^3\,a3^{10}\,a8^{11}\,a9^8-384\,a1^4\,a2^2\,a3^{10}\,a4^2\,a8^{12}\,a9^8-2304\,a1^4\,a2^2\,a3^{10}\,a4\,a6\,a8^{12}\,a9^8-384\,a1^4\,a2^2\,a3^{10}\,a6^2\,a8^{12}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a4^3\,a6\,a8^{13}\,a9^8+512\,a1^3\,a2\,a3^{10}\,a4^2\,a6^2\,a8^{13}\,a9^8+256\,a1^3\,a2\,a3^{10}\,a4\,a6^3\,a8^{13}\,a9^8\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-256\,a1^5\,a2^4\,a3^{10}\,a8^{10}\,a9^9+256\,a1^4\,a2^3\,a3^{10}\,a4^2\,a8^{11}\,a9^9+1536\,a1^4\,a2^3\,a3^{10}\,a4\,a6\,a8^{11}\,a9^9+256\,a1^4\,a2^3\,a3^{10}\,a6^2\,a8^{11}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4^3\,a6\,a8^{12}\,a9^9-768\,a1^3\,a2^2\,a3^{10}\,a4^2\,a6^2\,a8^{12}\,a9^9-384\,a1^3\,a2^2\,a3^{10}\,a4\,a6^3\,a8^{12}\,a9^9\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-64\,a1^4\,a2^4\,a3^{10}\,a4^2\,a8^{10}\,a9^{10}-384\,a1^4\,a2^4\,a3^{10}\,a4\,a6\,a8^{10}\,a9^{10}-64\,a1^4\,a2^4\,a3^{10}\,a6^2\,a8^{10}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a4^3\,a6\,a8^{11}\,a9^{10}+512\,a1^3\,a2^3\,a3^{10}\,a4^2\,a6^2\,a8^{11}\,a9^{10}+256\,a1^3\,a2^3\,a3^{10}\,a4\,a6^3\,a8^{11}\,a9^{10}\right),$$

$$-\frac{1}{64\,a1^3\,a3^{10}\,a8^{14}\,a9^7}\left(-64\,a1^3\,a2^4\,a3^{10}\,a4^3\,a6\,a8^{10}\,a9^{11}-128\,a1^3\,a2^4\,a3^{10}\,a4^2\,a6^2\,a8^{10}\,a9^{11}-64\,a1^3\,a2^4\,a3^{10}\,a4\,a6^3\,a8^{10}\,a9^{11}\right)\Big\}$$

In[∘]:=
```
Solve[Coeffs == xCoeffs, {β, δ, ϵ, μS, μE, μI, c, kE, kI}]
```

Solve: Equations may not give solutions for all "solve" variables.

Out[∘]= $$\left\{\left\{\beta\to\frac{a1\,a2\,kE}{a8\,\delta},\ \epsilon\to-\frac{a3\,\delta}{-a2+a2\,a3-a3\,\delta},\ \mu S\to a4,\ \mu E\to a2+a5-\delta,\ \mu I\to a6,\ kI\to\frac{a2\,a9\,kE}{a8\,\delta}\right\}\right\}$$

In[∘]:=

```
(* extra junk *)
```

In[∘]:=
```
GroebnerBasis[Coeffs - xCoeffs, {β, δ, ϵ, μS, μE, μI, c, kE}]
```

Out[∘]= $$\left\{-a3\,a7+c-\frac{a7\,a8}{kE}+\frac{a3\,a7\,a8}{kE},\ -\frac{a8}{c}+\frac{a8}{a3\,c}-\frac{kE}{a3\,a7}+\frac{kE}{c},\ \frac{1}{a7\,a8}-\frac{a3}{a8\,c}-\frac{1}{c\,kE}+\frac{a3}{c\,kE},\ -\frac{1}{a3\,a7\,a8}+\frac{1}{a8\,c}-\frac{1}{c\,kE}+\frac{1}{a3\,c\,kE},\ -a6+\mu I,\ -a2-a5+\frac{a2\,kE}{a8}+\mu E,\ -a4+\mu S,\ -\frac{a3\,a7}{c}+\epsilon,\ -1+\frac{a8}{kE}-\frac{a8}{a3\,kE}+\frac{1}{\epsilon},\ -\frac{a2\,kE}{a8}+\delta,\ -a1+\beta,\ -\frac{1}{a1}+\frac{1}{\beta}\right\}$$