```
Simplify[eqns13 /. {c_1|2 → c}]
```

$$V_0[0, c] == 1 \&\& V_0[c, 0] == 1 \&\& V_{11}[c, 0] == 0 \&\&$$
$$\frac{-1 + e^c + 2\,c\,e^c\,V_{12}[c, c]}{2\,c} == V_{21}[c, c] \&\& \frac{-1 + e^c + 2\,c\,e^c\,V_{12}[c, c] - 2\,c\,V_{21}[c, c]}{c} == 0 \&\&$$
$$\frac{(-1 + e^c)\,(-1 + e^c + 2\,c\,e^c\,V_{12}[c, c] - 2\,c\,V_{21}[c, c])}{c} == 0 \&\&$$
$$\frac{2\,c\,e^{c/2}\,V_{11}[c, c] - \left(-1 + e^{c/2}\right)\left(-1 + e^{c/2} - 2\,c\,V_{21}[c, c]\right)}{2\,c} == e^c\,V_{22}[c, c] \&\&$$
$$V_{22}[0, c] == 0 \&\& -\frac{\left(-1 + e^{c/2}\right)^2 + 2\,c\left(-e^{c/2} + e^c\right)V_{12}[c, c] - 2\,c\,e^{c/2}\,V_{22}[c, c]}{2\,c} == V_{11}[c, c]$$

```
Solve[(-1 + e^c + 2 c e^c V12[c, c])/(2 c) == V21[c, c] && (-1 + e^c + 2 c e^c V12[c, c] - 2 c V21[c, c])/c == 0 &&
 (-1 + e^c) (-1 + e^c + 2 c e^c V12[c, c] - 2 c V21[c, c])/c == 0 &&
 (2 c e^(c/2) V11[c, c] - (-1 + e^(c/2)) (-1 + e^(c/2) - 2 c V21[c, c]))/(2 c) == e^c V22[c, c] && V22[0, c] == 0 &&
 -((-1 + e^(c/2))^2 + 2 c (-e^(c/2) + e^c) V12[c, c] - 2 c e^(c/2) V22[c, c])/(2 c) == V11[c, c] &&
 V11[c, c] == 0 && V22[c, c] == 0, {V11[c, c], V12[c, c], V21[c, c], V22[c, c]}]
```

$$\left\{\left\{V_{11}[c, c] \to 0,\ V_{12}[c, c] \to -\frac{e^{-c/2}\left(-1 + e^{c/2}\right)}{2\,c},\ V_{21}[c, c] \to \frac{-1 + e^{c/2}}{2\,c},\ V_{22}[c, c] \to 0\right\}\right\}$$

```
Solve[eqns, {V11[c1, c2], V12[c1, c2], V21[c1, c2],
   V22[c1, c2], V11[c2, c1], V12[c2, c1], V21[c2, c1], V22[c2, c1]}][[1]]
```

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

$$\Bigg\{V_{11}[c_1, c_2] \to \frac{e^{-\frac{c_1}{2}}\left(-e^{\frac{c_1}{2}}\,c_1 + e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1 + c_2 - e^{\frac{c_1}{2}}\,c_2\right)}{c_1\,(c_1 + c_2)} - \frac{e^{-\frac{c_1}{2}}\left(-1 + e^{\frac{c_1}{2}}\right)c_2\,V_{21}[c_1, c_2]}{c_1} + e^{\frac{c_2}{2}}\,V_{22}[c_2, c_1],$$

$$V_{12}[c_1, c_2] \to \frac{e^{-c_1}\left(\frac{-1+e^{c_1}}{c_1} + \frac{1-e^{c_1+c_2}}{c_1+c_2}\right)}{-1 + e^{c_2}} + \frac{e^{-c_1}\,(-1 + e^{c_1})\,c_2\,V_{21}[c_1, c_2]}{(-1 + e^{c_2})\,c_1},$$

$$V_{22}[c_1, c_2] \to -\frac{e^{-c_1}\left(-1 + e^{\frac{c_1}{2}}\right)\left(-1 + e^{\frac{c_1}{2}+\frac{c_2}{2}}\right)}{\left(1 + e^{\frac{c_2}{2}}\right)(c_1 + c_2)} + e^{-\frac{c_1}{2}}\,V_{11}[c_2, c_1] + \frac{e^{-c_1}\,(-1 + e^{c_1})\,V_{21}[c_1, c_2]}{1 + e^{\frac{c_2}{2}}},$$

$$V_{12}[c_2, c_1] \to -\frac{e^{-\frac{c_1}{2}-\frac{c_2}{2}}\left(-1 + e^{\frac{c_1}{2}+\frac{c_2}{2}}\right)}{c_1 + c_2} + e^{-\frac{c_1}{2}-\frac{c_2}{2}}\,V_{21}[c_1, c_2],$$

$$V_{21}[c_2, c_1] \to -\frac{e^{-\frac{c_1}{2}}\left(-e^{\frac{c_1}{2}}\,c_1 + e^{\frac{c_1}{2}+c_2}\,c_1 - e^{c_1+\frac{c_2}{2}}\,c_2 + e^{\frac{c_2}{2}}\,c_2\right)}{(-1 + e^{c_2})\,c_1\,(c_1 + c_2)} + \frac{e^{-\frac{c_1}{2}+\frac{c_2}{2}}\,(-1 + e^{c_1})\,c_2\,V_{21}[c_1, c_2]}{(-1 + e^{c_2})\,c_1}\Bigg\}$$

```
Solve[eqns, {V11[c2, c1], V12[c2, c1], V21[c2, c1], V22[c2, c1]}]
```

$$\left\{\left\{V_{11}[c_2, c_1] \to \frac{1}{c_2\,(c_1+c_2)}\left(e^{\frac{c_1}{2}}\,c_1 - e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1 - c_2 + e^{\frac{c_1}{2}}\,c_2 + e^{\frac{c_1}{2}}\,c_1^2\,V_{12}[c_1, c_2] - e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1^2\,V_{12}[c_1, c_2] + e^{\frac{c_1}{2}}\,c_1\,c_2\,V_{12}[c_1, c_2] - e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1\,c_2\,V_{12}[c_1, c_2] + e^{\frac{c_1}{2}}\,c_1\,c_2\,V_{22}[c_1, c_2] + e^{\frac{c_1}{2}}\,c_2^2\,V_{22}[c_1, c_2]\right),\right.\right.$$

$$V_{12}[c_2, c_1] \to -\frac{e^{-\frac{c_1}{2}-\frac{c_2}{2}}\left(-1 + e^{\frac{c_1}{2}+\frac{c_2}{2}} - c_1\,V_{21}[c_1, c_2] - c_2\,V_{21}[c_1, c_2]\right)}{c_1+c_2},$$

$$V_{21}[c_2, c_1] \to \frac{-1 + e^{\frac{c_1}{2}+\frac{c_2}{2}} + e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1\,V_{12}[c_1, c_2] + e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_2\,V_{12}[c_1, c_2]}{c_1+c_2},\ V_{22}[c_2, c_1] \to$$

$$\left.\left.-\frac{1}{c_1\,(c_1+c_2)}e^{-\frac{c_1}{2}-\frac{c_2}{2}}\left(-e^{\frac{c_1}{2}}\,c_1 + e^{\frac{c_1}{2}+\frac{c_2}{2}}\,c_1 + c_2 - e^{\frac{c_1}{2}}\,c_2 - e^{\frac{c_1}{2}}\,c_1^2\,V_{11}[c_1, c_2] - e^{\frac{c_1}{2}}\,c_1\,c_2\,V_{11}[c_1, c_2] + c_1\,c_2\,V_{21}[c_1, c_2] - e^{\frac{c_1}{2}}\,c_1\,c_2\,V_{21}[c_1, c_2] + c_2^2\,V_{21}[c_1, c_2] - e^{\frac{c_1}{2}}\,c_2^2\,V_{21}[c_1, c_2]\right)\right\}\right\}$$