

In[36]:= **Solve**[ $\frac{1}{4} V^2 Y^4 - \frac{1}{2} V Y^2 - Y + 1 == 0$ , Y]

[résous](#)

$$\text{Out[36]} = \left\{ \left\{ Y \rightarrow -\frac{1}{2} \sqrt{\left( \frac{4}{3V} + \frac{26}{3 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}} + \frac{2 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}}{3V^2} \right)} - \frac{1}{2} \sqrt{\left( \frac{8}{3V} - \frac{26}{3 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}} - \frac{2 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}}{3V^2} \right)} \right. \\ \left. \frac{8}{V^2 \sqrt{\frac{4}{3V} + \frac{26}{3 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}} + \frac{2 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}}{3V^2}}} \right\}, \\ \left\{ Y \rightarrow -\frac{1}{2} \sqrt{\left( \frac{4}{3V} + \frac{26}{3 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}} + \frac{2 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}}{3V^2} \right)} + \frac{1}{2} \sqrt{\left( \frac{8}{3V} - \frac{26}{3 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}} - \frac{2 \left( 27V^2 + 35V^3 + 3\sqrt{3} \sqrt{27V^4 + 70V^5 - 36V^6} \right)^{1/3}}{3V^2} \right)} \right\} \right\}$$

$$\begin{aligned}
 & \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2} - \\
 & \frac{8}{\sqrt[3]{\frac{4}{3 V} + \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} + \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2}}} \left. \right\}, \\
 & \left\{ Y \rightarrow \frac{1}{2} \sqrt[3]{\left( \frac{4}{3 V} + \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} + \right.} \right. \\
 & \left. \left. \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2} \right) - \right. \\
 & \left. \frac{1}{2} \sqrt[3]{\left( \frac{8}{3 V} - \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} - \right.} \right. \\
 & \left. \left. \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2} + \right. \right. \\
 & \left. \left. \frac{8}{\sqrt[3]{\frac{4}{3 V} + \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} + \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2}}} \right) \right\}, \\
 & \left\{ Y \rightarrow \frac{1}{2} \sqrt[3]{\left( \frac{4}{3 V} + \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} + \right.} \right.
 \end{aligned}$$

$$\begin{aligned}
 & \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2} + \\
 & \frac{1}{2} \sqrt{\left( \frac{8}{3 V} - \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} - \right.} \\
 & \left. \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2} + \right. \\
 & \left. \left. \frac{8}{V^2 \sqrt{\frac{4}{3 V} + \frac{26}{3 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}} + \frac{2 \left( 27 V^2 + 35 V^3 + 3 \sqrt{3} \sqrt{27 V^4 + 70 V^5 - 36 V^6} \right)^{1/3}}{3 V^2}}} \right) \right\} \}
 \end{aligned}$$

In[45]:= **V = 0.00000001**

**Solve[1 / 4 V^2 Y^4 - 1 / 2 V Y^2 - Y + 1 == 0, Y]**

**résous**

Out[45]= **1. × 10<sup>-8</sup>**

Out[46]= **{ {Y → -171 095. - 296 008. i}, {Y → -171 095. + 296 008. i}, {Y → 1.}, {Y → 342 190.} }**