

In[632]:= $x^3 + (11 + (8/3)) * x^2 + (8/3) * (m + 10) * x + (160/3) * (m - 1) == 0$

Out[632]:= $\frac{160}{3} (-1 + m) + \frac{8}{3} (10 + m) x + \frac{41 x^2}{3} + x^3 == 0$

find the first solution

In[111]:= **Solve** $\left[\frac{1}{3} (-160 + 160 m + 80 x + 8 m x + 41 x^2 + 3 x^3) == 0, x\right][[1]]$

$$\left\{x \rightarrow -\frac{41}{9} - \frac{-961 + 72 m}{9 \left(-5201 - 15012 m + 36 \sqrt{3} \sqrt{-221310 + 91470 m + 54119 m^2 + 96 m^3}\right)^{1/3}} + \frac{1}{9} \left(-5201 - 15012 m + 36 \sqrt{3} \sqrt{-221310 + 91470 m + 54119 m^2 + 96 m^3}\right)^{1/3}\right\}$$

reduces the statement expr by solving the equation for vars and eliminating quantifiers.

$$\text{Reduce}\left[-\frac{41}{9} - \frac{-961 + 72 m}{9 \left(-5201 - 15012 m + 36 \sqrt{3} \sqrt{-221310 + 91470 m + 54119 m^2 + 96 m^3}\right)^{1/3}} + \frac{1}{9} \left(-5201 - 15012 m + 36 \sqrt{3} \sqrt{-221310 + m (91470 + m (54119 + 96 m))}\right)^{1/3} == 0, m\right]$$

$m == 1$