

4.7 Solving Radical Equations and Inequalities

LT25: I can solve radical equations and inequalities.

To solve radical equations, we want to first isolate the radical on one side of the equations, then eliminate it by taking the proper power.

$$\begin{aligned} \cancel{Ex} \quad 7 &= 3 - \sqrt[3]{x+11} \\ -3 & \quad -3 \\ 4 &= -\sqrt[3]{x+11} \\ -1 & \quad -1 \\ (-4)^3 &= (\sqrt[3]{x+11})^3 \\ -64 &= x+11 \\ -11 & \quad -11 \\ -75 &= x \end{aligned}$$

$$\begin{aligned} \cancel{Ex} \quad x &= \sqrt{x-3} + 3 \\ -3 & \quad -3 \\ (x-3)^2 &= (\sqrt{x-3})^2 \\ (x-3)(x-3) &= x-3 \\ x^2 - 3x - 3x + 9 &= x-3 \\ -x & \quad +3 \quad -x + 3 \\ x^2 - 7x + 12 &= 0 \\ (x-4)(x-3) &= 0 \\ x=4 \\ x=3 \end{aligned}$$

#30 $(\sqrt{b+4})^2 \leq (6)^2$

$$\begin{aligned} b+4 &\leq 36 \\ -4 & \quad -4 \\ b &\leq 32 \end{aligned}$$

Critical points

$$\begin{aligned} b &= 32 \\ b &= -4 \end{aligned}$$

check

$$\begin{aligned} b=-5 \quad \sqrt{-5+4} &\leq 6 \quad \times \\ b=0 \quad \sqrt{0+4} &\leq 6 \quad \checkmark \\ b=33 \quad \sqrt{33+4} &\leq 6 \quad \times \end{aligned}$$

$\therefore -4 \leq b \leq 32$