

$$\begin{aligned} \rightarrow \sqrt{2x-1} + 4 &= 7 \\ \hline \sqrt{2x-1} &= 3 \\ \hline 2x-1 &= 9 \\ +1 \quad +1 & \\ \hline 2x &= 10 \\ \frac{2x}{2} &= \frac{10}{2} \\ \hline \boxed{x=5} \end{aligned}$$

$$\textcircled{1} \begin{aligned} \overset{x=2}{\downarrow} \overset{x=-1}{\downarrow} \\ \sqrt{(2x-1)^2} + 4 &= 13 \\ \hline \sqrt{(2x-1)^2} &= 9 \end{aligned}$$

Quadratic Equations have two solutions

$$\begin{aligned} \sqrt{9} &= 3 \text{ because } 3^2 = 9 \\ \sqrt{9} &= -3 \text{ because } (-3)^2 = 9 \end{aligned}$$

$$\textcircled{2} \begin{aligned} \sqrt{(2x-1)^2} &= \pm \sqrt{9} \\ \downarrow & \\ 2x-1 &= \pm 3 \end{aligned}$$

when we take the $\sqrt{\quad}$ of both sides we must put \pm in front of $\sqrt{\quad}$

$$\begin{aligned} |2x-1| &= 3 \\ \swarrow \quad \searrow & \\ 2x-1=3 \quad & 2x-1=-3 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad 2x-1 &= 3 & 2x-1 &= -3 \\ \hline +1 \quad +1 & & +1 \quad +1 & \\ \hline 2x &= 4 & 2x &= -2 \\ \frac{2x}{2} &= \frac{4}{2} & \frac{2x}{2} &= \frac{-2}{2} \\ \hline \boxed{x=2} & & \boxed{x=-1} & \end{aligned}$$

Steps:

- ① Isolate the term that is being squared
- ② Take the $\sqrt{\quad}$ of both sides and remember to put $\pm \sqrt{\quad}$ on the #
- ③ Fully simplify the $\sqrt{\quad}$
OR
Setup two separate equations and solve for x
- ④ Check solutions by plugging back into the original problem

ex Quadratic Equation (two solutions)

$$\textcircled{1} \begin{aligned} 3x^2 - 6 &= 30 \\ \hline 3x^2 &= 36 \end{aligned}$$

$$\begin{aligned} \frac{3x^2}{3} &= \frac{36}{3} \\ \hline x^2 &= 12 \end{aligned}$$

$$\textcircled{2} \begin{aligned} \sqrt{x^2} &= \pm \sqrt{12} \\ \downarrow & \end{aligned}$$

$$\begin{aligned} x &= \pm \sqrt{12} \\ &= \pm \sqrt{4 \cdot 3} \\ &\quad \downarrow \quad \downarrow \end{aligned}$$

$$\begin{aligned} \boxed{x = \pm 2\sqrt{3}} \\ \text{OR} \\ \boxed{x = 2\sqrt{3}, -2\sqrt{3}} \end{aligned}$$