

Sec. 6.5 Solving Square Root and Other Radical Equations

Ex: $\sqrt{x+4} + 6 = 7$

D: $x+4 \geq 0$ $x \geq -4$

$$\frac{\sqrt{x+4} + 6 = 7}{-6 \quad -6}$$

$$(\sqrt{x+4})^2 = (1)^2$$

$$\frac{x+4 = 1}{-4 \quad -4}$$

$$\boxed{x = -3}$$

$$\begin{array}{r} +4 \quad -4 \\ \sqrt{\quad} \quad ^2 \end{array}$$

$$+6 \quad -6$$

$$(\sqrt{x+4})(\sqrt{x+4})$$

$$\frac{\sqrt{(x+4)(x+4)}}{(x+4)}$$

Ex: $(\sqrt{3x})^2 = (\sqrt{x+6})^2$

$$\frac{3x = x+6}{-x \quad -x}$$

$$\frac{2x = 6}{2 \quad 2}$$

$$x = 3$$

Ex: $(6x+9)^{\frac{1}{3}} - 5 = -2$

$$\frac{(6x+9)^{\frac{1}{3}} - 5 = -2}{+5 \quad +5}$$

$$\left[(6x+9)^{\frac{1}{3}} \right]^3 = 3^3$$

$$\frac{6x+9 = 27}{-9 \quad -9} \leftarrow \left(\sqrt[3]{6x+9} \right)^3 = 3^3$$

$$\frac{6x = 18}{6 \quad 6}$$

$$x = 3$$

$$\begin{array}{r} \times 6 \div 6 \\ +9 \quad -9 \end{array}$$

$$\begin{array}{r} ^{\frac{1}{3}} \quad ^{\frac{3}{1}} \\ -5 \quad +5 \end{array}$$

$$Ex: \frac{3(x+3)^{\frac{3}{4}}}{3} = \frac{81}{3}$$

P	+3	-3
E	$\wedge \frac{3}{4}$	$\wedge \frac{4}{3}$
MD	$\cdot 3$	$\div 3$

$$\left[(x+3)^{\frac{3}{4}} \right]^{\frac{4}{3}} = 27^{\frac{4}{3}}$$

$$x+3 = \left(\sqrt[3]{27} \right)^4$$

$$x+3 = 3^4$$

$$x+3 = 81$$

$$\begin{array}{r} -3 \quad -3 \\ \hline \end{array}$$

$$\boxed{x = 78}$$