

Solving Radical Equations

$$\textcircled{1} \begin{array}{r} \sqrt{x} - 7 = 0 \\ +7 \quad +7 \\ \hline (\sqrt{x})^2 = (7)^2 \\ \boxed{x = 49} \end{array}$$

check!

$$\begin{array}{r} \sqrt{49} - 7 = 0 \\ 7 - 7 = 0 \\ 0 = 0 \checkmark \end{array}$$

$$\textcircled{2} \begin{array}{r} 2\sqrt{x} - 8 = 0 \\ +8 \quad +8 \\ \hline 2\sqrt{x} = 8 \\ \frac{2\sqrt{x}}{2} = \frac{8}{2} \\ (\sqrt{x})^2 = 4^2 \\ \boxed{x = 16} \end{array}$$

check!

$$\begin{array}{r} 2\sqrt{16} - 8 = 0 \\ 2 \cdot 4 - 8 = 0 \\ 8 - 8 = 0 \\ 0 = 0 \checkmark \end{array}$$

$$\textcircled{3} \begin{array}{r} 12\sqrt{x} - 3 = 0 \\ +3 \quad +3 \\ \hline 12\sqrt{x} = 3 \\ \frac{12\sqrt{x}}{12} = \frac{3}{12} \\ (\sqrt{x})^2 = \left(\frac{1}{4}\right)^2 \\ \boxed{x = \frac{1}{16}} \end{array}$$

check!

$$\begin{array}{r} 12\sqrt{\frac{1}{16}} - 3 = 0 \\ 12 \cdot \frac{1}{4} - 3 = 0 \\ \frac{12}{4} - 3 = 0 \\ 3 - 3 = 0 \\ 0 = 0 \checkmark \end{array}$$

$$\textcircled{4} \begin{array}{r} 4\sqrt{x-7} + 12 = 28 \\ -12 \quad -12 \\ \hline 4\sqrt{x-7} = 16 \\ \frac{4\sqrt{x-7}}{4} = \frac{16}{4} \\ (\sqrt{x-7})^2 = 4^2 \\ x-7 = 16 \\ +7 \quad +7 \\ \boxed{x = 23} \end{array}$$

check!

$$\begin{array}{r} 4\sqrt{23-7} + 12 = 28 \\ 4\sqrt{16} + 12 = 28 \\ 4 \cdot 4 + 12 = 28 \\ 16 + 12 = 28 \\ 28 = 28 \checkmark \end{array}$$

$$\textcircled{5} \begin{array}{r} 2\sqrt{x+6} + 9 = 21 \\ -9 \quad -9 \\ \hline 2\sqrt{x+6} = 12 \\ \frac{2\sqrt{x+6}}{2} = \frac{12}{2} \\ (\sqrt{x+6})^2 = 6^2 \\ x+6 = 36 \\ -6 \quad -6 \\ \boxed{x = 30} \end{array}$$

check!

$$\begin{array}{r} 2\sqrt{30+6} + 9 = 21 \\ 2\sqrt{36} + 9 = 21 \\ 2 \cdot 6 + 9 = 21 \\ 12 + 9 = 21 \\ 21 = 21 \checkmark \end{array}$$

$$\textcircled{6} \begin{array}{r} \sqrt{x-5} + 7 = 12 \\ -7 \quad -7 \\ \hline (\sqrt{x-5})^2 = 5^2 \\ x-5 = 25 \\ +5 \quad +5 \\ \boxed{x = 30} \end{array}$$

check!

$$\begin{array}{r} \sqrt{30-5} + 7 = 12 \\ \sqrt{25} + 7 = 12 \\ 5 + 7 = 12 \\ 12 = 12 \checkmark \end{array}$$