

5.5 Practice Problems

Directions: Simplify.

1) $-8\sqrt{112}$

$$\begin{aligned} & -8\sqrt{16\sqrt{7}} \\ & -8 \cdot 4\sqrt{7} \\ & \boxed{-32\sqrt{7}} \end{aligned}$$

2) $2\sqrt{20} \cdot 3\sqrt{2}$

$$\begin{aligned} & 6\sqrt{40} \\ & 6\sqrt{4\sqrt{10}} \\ & 6 \cdot 2\sqrt{10} \\ & \boxed{12\sqrt{10}} \end{aligned}$$

3) $-3\sqrt{15} \cdot 4\sqrt{3}$

$$\begin{aligned} & -12\sqrt{45} \\ & -12\sqrt{9\sqrt{5}} \\ & -12 \cdot 3\sqrt{5} \\ & \boxed{-36\sqrt{5}} \end{aligned}$$

4) $\frac{2\sqrt{15}}{\sqrt{5}\sqrt{3}}$

$$\frac{2\sqrt{15}}{\sqrt{25}} = \boxed{\frac{2\sqrt{5}}{5}}$$

5) $\frac{5}{4-2\sqrt{3}} \cdot \frac{(4+2\sqrt{3})}{(4+2\sqrt{3})}$

$$\begin{aligned} & \frac{20 + 10\sqrt{3}}{16 + 8\sqrt{3} - 8\sqrt{3} - 4\sqrt{9}} \\ & \frac{20 + 10\sqrt{3}}{16 - 12} = \boxed{\frac{20 + 10\sqrt{3}}{4}} \end{aligned}$$

6) $\frac{5}{2+\sqrt{2}} \cdot \frac{(2-\sqrt{2})}{(2-\sqrt{2})}$

$$\begin{aligned} & \frac{10 - 5\sqrt{2}}{4 - 2\sqrt{2} + 2\sqrt{2} - \sqrt{4}} \\ & \frac{10 - 5\sqrt{2}}{2} \end{aligned}$$

Directions: Solve.

7) $p^2 + 5 = 16$

$$\begin{aligned} & \begin{array}{r} -5 \quad -5 \\ \hline p^2 = 11 \end{array} \\ & \boxed{p = \pm\sqrt{11}} \end{aligned}$$

8) $10x^2 - 10 = 110$

$$\begin{aligned} & \begin{array}{r} +10 \quad 110 \\ \hline 10x^2 = 120 \end{array} \\ & \frac{10x^2}{10} = \frac{120}{10} \\ & \sqrt{x^2} = \sqrt{12} \\ & x = \pm\sqrt{4\sqrt{3}} \\ & \boxed{x = \pm 2\sqrt{3}} \end{aligned}$$

$$9) 9r^2 + 7 = 232$$

$$\begin{array}{r} -7 \quad -7 \\ \hline 9r^2 = 225 \\ \uparrow \quad \uparrow \\ \sqrt{r^2} = \sqrt{25} \\ \boxed{r = \pm 5} \end{array}$$

$$10) 2n^2 + 5 = 37$$

$$\begin{array}{r} -5 \quad -5 \\ \hline 2n^2 = 32 \\ \frac{2n^2}{2} = \frac{32}{2} \\ \sqrt{n^2} = \sqrt{16} \\ \boxed{n = \pm 4} \end{array}$$

$$11) 7r^2 - 6 = 246$$

$$\begin{array}{r} +6 \quad +6 \\ \hline 7r^2 = 252 \\ \frac{7r^2}{7} = \frac{252}{7} \\ \sqrt{r^2} = \sqrt{36} \\ \boxed{r = \pm 6} \end{array}$$

$$12) \frac{1}{5}(x+4)^2 = 10 \quad (5)$$

$$\begin{array}{r} \sqrt{(x+4)^2} = \sqrt{50} \\ (x+4) = \pm \sqrt{25} \sqrt{2} \\ x+4 = \pm 5\sqrt{2} \\ -4 \quad -4 \\ \hline \boxed{x = -4 \pm 5\sqrt{2}} \end{array}$$

$$13) 4(x-6)^2 = 100$$

$$\begin{array}{r} \frac{4}{4} \quad \frac{4}{4} \\ \hline \sqrt{(x-6)^2} = \sqrt{25} \\ x-6 = \pm 5 \\ +6 \quad +6 \\ \hline x = \pm 5 + 6 \\ 5+6 = 11 \quad \text{or} \quad -5+6 = 1 \\ \boxed{11 \text{ or } 1} \end{array}$$

$$14) (g-5)^2 + 4 = 53$$

$$\begin{array}{r} -4 \quad -4 \\ \hline \sqrt{(g-5)^2} = \sqrt{49} \\ g-5 = \pm 7 \\ g-5 = \pm 7 \\ +5 \quad +5 \\ \hline g = 7+5 \quad \text{or} \quad -7+5 \\ \boxed{12 \text{ or } -2} \end{array}$$

$$15) \frac{h^2}{8} + 6 = 10$$

$$\begin{array}{r} -6 \quad -6 \\ \hline \frac{h^2}{8} = 4 \quad (8) \\ \sqrt{h^2} = \sqrt{32} \\ h = \pm \sqrt{16} \sqrt{2} \\ \boxed{h = \pm 4\sqrt{2}} \end{array}$$

$$16) \frac{1}{2}(x+9)^2 - 12 = 2$$

$$\begin{array}{r} \frac{1}{2}(x+9)^2 = 14 \quad (2) \\ \sqrt{(x+9)^2} = \sqrt{28} \\ (x+9) = \pm \sqrt{4} \sqrt{7} \\ x+9 = \pm 2\sqrt{7} \\ -9 \quad -9 \\ \hline \boxed{x = -9 \pm 2\sqrt{7}} \end{array}$$