

Simplify completely.

$$\begin{aligned}
 1. \quad & 2\sqrt{3528} \\
 &= 2\sqrt{36 \cdot 98} \\
 &= 2\sqrt{36 \cdot 49 \cdot 2} \\
 &= 84\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & 3\sqrt{1008} \\
 &= 3\sqrt{16 \cdot 9 \cdot 7} \\
 &= 36\sqrt{7}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & \frac{2\sqrt{2}}{\sqrt{8}} \cdot \frac{\sqrt{8}}{\sqrt{8}} \\
 &= \frac{2 \cdot 4}{8} \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & \frac{9}{\sqrt{27}} \\
 &= \frac{9}{3\sqrt{3}} \\
 &= \frac{3\sqrt{3}}{3} = \sqrt{3}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & \frac{4\sqrt{20}}{\sqrt{10}} \\
 &= 4\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & \frac{\sqrt{24}}{\sqrt{6}} \\
 &= 2
 \end{aligned}$$

$$\begin{aligned}
 7. \quad & \sqrt{30} + 2\sqrt{108} + 2\sqrt{1600} - 7\sqrt{75} \\
 &= \sqrt{30} + 12\sqrt{3} + 2 \cdot 40 - 35\sqrt{3} \\
 &= \sqrt{30} - 23\sqrt{3} + 80
 \end{aligned}$$

$$\begin{aligned}
 8. \quad & \sqrt{18} - 3\sqrt{320} + 2\sqrt{32} \\
 &= 3\sqrt{2} - 24\sqrt{5} + 8\sqrt{2} \\
 &= 11\sqrt{2} - 24\sqrt{5}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & (6\sqrt{5})^2 \\
 &= 36 \cdot 5 \\
 &= 180
 \end{aligned}$$

$$\begin{aligned}
 10. \quad & (3\sqrt{2})^3 \\
 &= 27 \cdot 2 \cdot \sqrt{2} \\
 &= 54\sqrt{2}
 \end{aligned}$$

$$\begin{aligned}
 11. \quad & (3 - 4\sqrt{6})(2 + 5\sqrt{6}) \\
 &= 6 + 15\sqrt{6} - 8\sqrt{6} - 20 \cdot 6 \\
 &= -114 + 7\sqrt{6}
 \end{aligned}$$

Solve for x.

12. $x^2 - 45 = 0$

$$x^2 = 45$$

$$x = \pm 3\sqrt{5}$$

13. $x^2 + 5x - 24 = 0$

$$= (x+8)(x-3) = 0$$

$$x = -8, 3$$

14. $3(x-5)^2 + 4 = 112$

$$3(x-5)^2 = 108$$

$$(x-5)^2 = 36$$

$$x-5 = 6 \text{ OR } x-5 = -6$$

$$x = 11, -1$$

15. $2(x+6)^2 - 5 = 93$

$$2(x+6)^2 = 98$$

$$(x+6)^2 = 49$$

$$x+6 = 7 \text{ OR } x+6 = -7$$

$$x = 1, -13$$

16. $3x^2 - 36x + 108 = 0$

$$x^2 - 12x + 36 = 0$$

$$(x-6)^2 = 0$$

$$x = 6$$

17. $4x^2 + 14x - 8 = 0$

$$2x^2 + 7x - 4 = 0$$

$$(2x-1)(x+4) = 0$$

$$x = \frac{1}{2}, -4$$

18. $x^2 + 14x - 8 = 0$

$$x = \frac{-14 \pm \sqrt{228}}{2}$$

$$= \frac{-14 \pm 2\sqrt{57}}{2}$$

$$= -7 \pm \sqrt{57}$$

19. $3x^2 + 10x - 7 = 0$

$$x = \frac{-10 \pm \sqrt{184}}{6}$$

$$= \frac{-10 \pm 2\sqrt{46}}{6}$$

$$= \frac{-5 \pm \sqrt{46}}{3}$$