

p.521 #11, 14, 15, 30, 37, 40, 49, 52, 53

1.  $\frac{5x - 15}{5x + 35}$

$\frac{\cancel{5}(x-3)}{\cancel{5}(x+7)}$

$$\frac{2x - 12}{2x + 4}$$

$\frac{\cancel{2}(x-6)}{\cancel{2}(x+2)}$

$$2. \frac{x^2 + 4x - 21}{x^2 + x - 42}$$

$$\begin{array}{r} 7 \\ \times \\ 4 \\ \hline -3 \end{array}$$

$$\frac{\cancel{(x+7)}(x-3)}{\cancel{(x+7)}(x-6)}$$

$$\begin{array}{r} -5 \\ \times \\ -9 \\ \hline -4 \end{array}$$

$$\frac{x^2 - 9x + 20}{x^2 - 7x + 12}$$

$$\frac{\cancel{(x-5)}(x-4)}{\cancel{(x-3)}(x-4)}$$

Difference of Squares.

$$\frac{y^2 - 4}{5y} \cdot \frac{2y}{y - 2}$$

$$\frac{(y+5)(y-5)}{y^2 - 25} \cdot \frac{3y}{y-5}$$

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

$$\frac{3(y+5)}{2}$$

**Divide.**

$$\frac{x^2 + 4x}{x^2 + 6x + 8} \div \frac{x - 3}{x + 2}$$

$$\frac{x \cancel{(x+4)}}{\cancel{(x+4)} \cancel{(x+2)}} \cdot \frac{\cancel{(x+2)}}{(x-3)}$$

$$\frac{x}{x-3}$$

$$\frac{s^2 + 6s}{s^2 + 11s + 30} \div \frac{s + 3}{s + 5}$$

Simplify the radical expression.

5.  $3\sqrt{50}$

$$3 \cdot \sqrt{25} \cdot \sqrt{2}$$
$$3 \cdot 5 \cdot \sqrt{2}$$
$$15\sqrt{2}$$

$$-2\sqrt{125}$$
$$-2\sqrt{25} \cdot \sqrt{5}$$
$$-2 \cdot 5 \cdot \sqrt{5}$$
$$-10\sqrt{5}$$

6.  $\sqrt{75a^2}$

$$\sqrt{25} \cdot \sqrt{3} \cdot \sqrt{a^2}$$
$$5 \cdot \sqrt{3} \cdot a$$
$$5a\sqrt{3}$$

$$-3\sqrt{98x^3}$$
$$-3\sqrt{49} \cdot \sqrt{2} \cdot \sqrt{x^2} \cdot \sqrt{x}$$
$$-3 \cdot 7 \cdot \sqrt{2} \cdot x \cdot \sqrt{x}$$
$$-21x\sqrt{2x}$$

$$7. -2\sqrt{2p} \cdot 2\sqrt{22}$$

$$= 4\sqrt{44p}$$

$$= 4\sqrt{4} \cdot \sqrt{11p}$$

$$= 4 \cdot 2 \cdot \sqrt{11p}$$

$$= 8\sqrt{11p}$$

$$8. \quad \sqrt{\frac{10}{81}} \quad \frac{\sqrt{10}}{\sqrt{81}} \quad \boxed{\frac{\sqrt{10}}{9}} \quad \sqrt{\frac{5}{16p^4}} \quad \frac{\sqrt{5}}{\sqrt{16}\sqrt{p^4}} = \frac{\sqrt{5}}{4p^2}$$

Simplify the radical expression by **rationalizing** the denominator.

$$9. \quad \frac{4}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{\sqrt{9}} = \frac{4\sqrt{3}}{3} \quad \frac{3}{\sqrt{15}} \cdot \frac{\sqrt{15}}{\sqrt{15}} = \frac{3\sqrt{15}}{5\sqrt{15}} = \frac{\sqrt{15}}{5}$$

**Simplify the expression.**

10.  $5\sqrt{10} + 4\sqrt{10} = 9\sqrt{10}$

$$5x + 4x = 9x$$

$$5\sqrt{10} \cdot 4\sqrt{10} = 20\sqrt{100}$$

$$5x \cdot 4x = 20x^2$$

11.  $7\sqrt{2} - \sqrt{18}$

$$7\sqrt{2} - \sqrt{9 \cdot 2}$$

$$7\sqrt{2} - 3\sqrt{2}$$

$$4\sqrt{2}$$

Solve the equation. Check your solution.

12.  $9 = \sqrt{g} + 5$   
 $4^2 = \sqrt{g}$   
 $16 = g$

13.  $\sqrt{q-10} = 3$

$$q - 10 = 9$$

$$q = 19$$

$$\begin{aligned} -3 &= \sqrt{q} - 4 \\ +4 & \quad +4 \\ 1 &= \sqrt{q} \end{aligned}$$

$$1 = 9$$

$$14. \sqrt{11x - 8} = \sqrt{10x + 5}$$

$$11x - 8 = 10x + 5$$

$-10x$                    $-10x$

$$x - 8 = 5$$

$$x = 13$$

Solve the equation. Identify any extraneous solutions.

$$15. \quad x^2 = \sqrt{-3x + 40}$$

$$x^2 = -3x + 40$$

*(Note: Red annotations show +3x-40 on the left, +3x under -3x, and -40 under 40)*

$$x^2 + 3x - 40 = 0$$

$$(x+8)(x-5) = 0$$

$$\begin{array}{cc} & -40 \\ 8 & -5 \\ & 3 \end{array}$$

*(Note: The numbers 8, -5, and 3 are circled and crossed out with a red X)*

$$\begin{array}{c} \uparrow \\ \cancel{8} \end{array}$$

$$\begin{array}{c} \uparrow \\ \textcircled{5} \end{array}$$

$$5\sqrt{2} - 3\sqrt{8}$$

$$5\sqrt{2} - 3\sqrt{4}\sqrt{2}$$

$$5\sqrt{2} - 3 \cdot 2\sqrt{2}$$

$$5\sqrt{2} - 6\sqrt{2}$$

$$-\sqrt{2}$$