

Name _____

KEY

DATE _____

10-2

Practice

Simplifying Radicals

Simplify each radical expression.

$$1. \sqrt{12} = \sqrt{4 \cdot 3}$$

$$= 2\sqrt{3}$$

$$2. \sqrt{28} = \sqrt{4 \cdot 7}$$

$$= 2\sqrt{7}$$

$$3. \sqrt{180} = \sqrt{36 \cdot 5}$$

$$\begin{array}{c} \textcircled{9} \text{ } \textcircled{20} \\ \text{ } \textcircled{4} \text{ } \textcircled{5} \end{array} = 6\sqrt{5}$$

$$4. \sqrt{75a^2} = \sqrt{25 \cdot 3 \cdot a^2}$$

$$= 5a\sqrt{3}$$

$$5. \sqrt{45x^6y^2}$$

$$= \sqrt{9 \cdot 5 \cdot (x^3)^2 \cdot y^2}$$

$$= 3x^3y\sqrt{5}$$

$$6. \sqrt{27m^3n^5}$$

$$= \sqrt{9 \cdot 3 \cdot m^2 \cdot m \cdot n^4 \cdot n}$$

$$= 3mn^2\sqrt{3mn}$$

$$7. -2\sqrt{36x^{13}y^7}$$

$$= -2\sqrt{6^2 \cdot x^{12} \cdot x \cdot y^6 \cdot y}$$

$$= -2(6)(x^6)(y^3)\sqrt{xy}$$

$$= -12x^6y^3\sqrt{xy}$$

$$8. \sqrt{21a^3b} \cdot \sqrt{3ab^5}$$

$$= \sqrt{63a^4b^6}$$

$$= \sqrt{9 \cdot 7a^4b^6}$$

$$= 3a^2b^3\sqrt{7}$$

$$9. 3\sqrt{2m^2} \cdot 5\sqrt{10m}$$

$$= 15\sqrt{20m^2 \cdot m}$$

$$= 15\sqrt{4 \cdot 5 \cdot m^2 \cdot m}$$

$$= 15(2)m\sqrt{5m}$$

$$= 30m\sqrt{5m}$$

$$10. 4\sqrt{24a} \cdot \sqrt{32a}$$

$$= 4\sqrt{768 \cdot a^2}$$

$$= 4\sqrt{256 \cdot 3 \cdot a^2}$$

$$= 4(16)a\sqrt{3}$$

$$= 64a\sqrt{3}$$

768

$$\begin{array}{c} 24 \quad 32 \\ \textcircled{4} \textcircled{6} \quad \textcircled{16} \textcircled{2} \\ \textcircled{2} \textcircled{3} \end{array}$$

$$11. \frac{1}{4}\sqrt{x^5y^4} \cdot 8\sqrt{x^3y}$$

$$= \left(\frac{1}{4}\right)(8)\sqrt{x^8y^4 \cdot y}$$

$$= 2x^4y^2\sqrt{y}$$

$$12. \frac{2}{3}\sqrt{15x^7} \cdot 6\sqrt{3x^2}$$

$$= \left(\frac{2}{3}\right)(6)\sqrt{45x^9}$$

$$= 4\sqrt{9 \cdot 5 \cdot x^8 \cdot x}$$

$$= 4(3)(x^4)\sqrt{5x}$$

$$= 12x^4\sqrt{5x}$$

Simplify each radical expression.

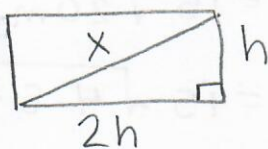
$$13. \sqrt{\frac{36}{25}} = \sqrt{\frac{6}{5}} \left(\frac{\sqrt{5}}{\sqrt{5}} \right) \\ = \frac{\sqrt{30}}{5}$$

$$14. \frac{2}{\sqrt{7}} \left(\frac{\sqrt{7}}{\sqrt{7}} \right) = \frac{2\sqrt{7}}{7}$$

$$15. \frac{\sqrt{5}}{\sqrt{3x}} \left(\frac{\sqrt{3x}}{\sqrt{3x}} \right) \\ = \frac{\sqrt{15x}}{3x}$$

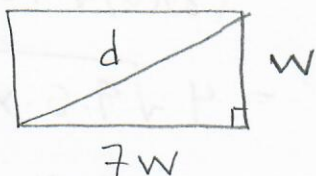
$$16. \frac{3}{\sqrt{49x}} = \frac{3}{7\sqrt{x}} \left(\frac{\sqrt{x}}{\sqrt{x}} \right) \\ = \frac{3\sqrt{x}}{7x}$$

17. A carpenter is building rectangular walls for a room addition. The width of a section of wall is two times the height. Each section has a brace that connects two opposite corners of the section. What is a simplified expression for the length of each brace?



$$x^2 = h^2 + (2h)^2 \\ x^2 = h^2 + 4h^2 \\ \sqrt{x^2} = \sqrt{5h^2} \\ x = h\sqrt{5} \text{ units}$$

18. A walking path, shaped like a rectangle, has a length 7 times the width, w . What is a simplified expression for the distance between opposite corners of the walking path?



$$d^2 = w^2 + (7w)^2 \\ d^2 = w^2 + 49w^2 \\ \sqrt{d^2} = \sqrt{50w^2} \\ d = \sqrt{25 \cdot 2 \cdot w^2} \\ d = 5w\sqrt{2} \text{ units}$$