Unit 8 Study Guide

Name KEY

Algebra 1

Date _____

Simplify the expression.
(The simplified expression should have no parentheses or negative exponents.)

1. $(x^5)^6$

$x^{5\cdot 6} = \boxed{x^{30}}$

2. $x^7 \bullet x^9$

$x^{7+9} = \boxed{x^{16}}$

3. $(xy)^0(x)$

$1(x) = \boxed{x}$

4. $-x^3$

$\boxed{-x^3}$

5. $y^3 \bullet y^2 \bullet y^0$

$y^{3+2+0} = \boxed{y^5}$

6. $\dfrac{48a^{-3}b^4}{6ab^{-2}}$

$\dfrac{48b^4b^2}{6aa^3} = \boxed{\dfrac{8b^6}{a^4}}$

8. $(3x^2)(-4x^3)^2$

$(3x^2)(16x^6) = \boxed{48x^8}$

9. $(-2x^2y)^4$

$(-2)^4(x^2)^4y^4 = \boxed{16x^8y^4}$

10. $\left(\dfrac{2}{3}\right)^{-1}$

$\dfrac{2^{-1}}{3^{-1}} = \boxed{\dfrac{3}{2}}$

11. $3b^{-3}$

$\boxed{\dfrac{3}{b^3}}$

12. $\dfrac{6y^8}{2y^2}$

$3y^{8-2}$

$\boxed{3y^6}$

13. $(-15a^3b^4c)^2$

$(-15)^2(a^3)^2(b^4)^2c^2$

$\boxed{225a^6b^8c^2}$

7. $\left(\frac{4x^{-3}y^3}{3xy}\right)\left(\frac{9xy^4}{2x^{-2}}\right)$

$\frac{36x^{-2}y^7}{6x^{-1}y} = \frac{36x^1y^7}{6x^2y}$

$= \frac{6y^6}{x}$

14. $(4x^{-3}yz^4)^3$

$(4)^3(x^{-3})^3y^3(z^4)^3$

$64x^{-9}y^3z^{12}$

$\frac{64y^3z^{12}}{x^9}$

Write each radical in simplest form.

1. $\sqrt{98}$

$49 \cdot 2$

$7\sqrt{2}$

2. $\sqrt{\frac{2k^2}{8k}}$

3. $\sqrt{\frac{6}{x^2}}$

4. $\sqrt[3]{54}$

$9 \cdot 6$

$3 \cdot 3 \cdot 3 \cdot 2$

$3\sqrt[3]{2}$

5. $\sqrt{72m^6}$

$9 \cdot 8$

$3 \cdot 3 \cdot 2 \cdot 4$

$2 \cdot 2$

$2 \cdot 3 \cdot m \cdot m \cdot m\sqrt{2}$

$6m^3\sqrt{2}$

6. $\sqrt{121x^3}$

$x \cdot x \cdot x$

$11 \cdot 11$

$11x\sqrt{x}$

7. $5x\sqrt{300x^5}$

$x \cdot x \cdot x \cdot x \cdot x$

$3 \cdot 100$

$10 \cdot 10$

$5x \cdot 10 \cdot x \cdot x\sqrt{3}$

$50x^3\sqrt{3x}$

8. $3\sqrt[3]{16}$

$8 \cdot 2$

$2 \cdot 4$

$2 \cdot 2$

$2 \cdot 3\sqrt[3]{2}$

$6\sqrt[3]{2}$

Simplify each expression by finding the sum, difference, or product.

9. $\sqrt{7} \cdot \sqrt{21}$

$\sqrt{147}$ → $2 \cdot 7 \cdot 3 \cdot 7$ → $7\sqrt{3}$

10. $5\sqrt{2} + \sqrt{50}$

$5\sqrt{2} + 5\sqrt{2}$

$10\sqrt{2}$

$\sqrt{50}$ → $25 \cdot 2$ → $5 \cdot 5$

11. $5\sqrt{14} + \sqrt{14}$

$6\sqrt{14}$

12. $3\sqrt{2} - \sqrt{128}$

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

$-5\sqrt{2}$

$\sqrt{128}$ → $64 \cdot 2$ → $8 \cdot 8$ → $8\sqrt{2}$

13. $7\sqrt{6} - \sqrt{24}$

$7\sqrt{6} - 2\sqrt{6}$

$5\sqrt{6}$

$\sqrt{24}$ → $8 \cdot 3$ → $2 \cdot 4 \cdot 3$ → $2 \cdot 2 \cdot 3$ → $2\sqrt{6}$

14. $5\sqrt{8z^3} \cdot z\sqrt{6z}$

$5z\sqrt{48z^4}$ → $6 \cdot 8$ → $3 \cdot 2 \cdot 4$ → $2 \cdot 2$

$5 \cdot 2 \cdot 2 \cdot 2 \cdot 2 z^2\sqrt{3}$

$20z^3\sqrt{3}$

Multiple Choice: Write the letter of the correct response on the line.

15. B Which expression is equivalent to $\sqrt{18} \cdot \sqrt{6}$ in its simplest form?

a. $5\sqrt{3}$
b. $6\sqrt{3}$
c. $3\sqrt{12}$
d. $2\sqrt{6}$

$\sqrt{108}$ → $12 \cdot 9$ → $3 \cdot 4 \cdot 3 \cdot 3$ → $2 \cdot 2 \cdot 3 \cdot 3$ → $6\sqrt{3}$

16. D Which expression is equivalent to $\sqrt{75} - 3\sqrt{27} + 4\sqrt{18}$?

a. $4\sqrt{3} + 12\sqrt{2}$
b. $16\sqrt{5}$
c. $16\sqrt{3}$
d. $-4\sqrt{3} + 12\sqrt{2}$

$5\sqrt{3} - 9\sqrt{3} + 12\sqrt{2}$

$-4\sqrt{3} + 12\sqrt{2}$