Name _____ Date _____ Class _____

LESSON 11-2

Simplifying Radical Expressions

Practice and Problem Solving: A/B

Simplify each expression. Assume all variables are positive.

1. $-3\sqrt{12r}$

2. $4^{\frac{3}{2}} \cdot 4^{\frac{5}{2}}$

3. $\dfrac{27^{\frac{4}{3}}}{27^{\frac{2}{3}}}$

4. $\dfrac{\left(a^2\right)^2}{a^{\frac{3}{2}}b^{\frac{1}{2}} \cdot b}$

5. $\left(27 \cdot 64\right)^{\frac{2}{3}}$

6. $\left(\dfrac{1}{243}\right)^{\frac{1}{5}}$

7. $\dfrac{\left(25x\right)^{\frac{3}{2}}}{5x^{\frac{1}{2}}}$

8. $\left(4x\right)^{-\frac{1}{2}} \cdot \left(9x\right)^{\frac{1}{2}}$

9. $3\sqrt[3]{81x^4y^2}$

10. $-5\sqrt[3]{-500x^5y^3}$

Solve.

11. The frequency, *f*, in Hz, at which a simple pendulum rocks back and forth is given by $f = \dfrac{1}{2\pi}\sqrt{\dfrac{g}{l}}$, where *g* is the strength of the gravitational field at the location of the pendulum, and *l* is the length of the pendulum.

    a. Rewrite the formula so that it gives the length *l* of the pendulum in terms of *g* and *f*. Then simplify the formula using the fact that the gravitational field is approximately 32 ft/s^2.

    b. Use the equation found in part a to find the length of a pendulum, to the nearest foot, that has a frequency of 0.52 Hz.

3. $\left(\frac{2}{11}\right)^{\frac{4}{9}}$

4. $\sqrt{7}$

5. $\sqrt[3]{11}$

6. $\sqrt[4]{x^5}$

7. $\sqrt{15^3}$

8. $\sqrt[3]{x^7}$

9. $\sqrt[4]{\left(\frac{5}{7}\right)^5}$

Success for English Learners

1. Yes, the expression would be equivalent. The order does not matter.
2. Possible answer: Sometimes it is easier to solve a problem as a radical and sometimes it is easier to solve it as a rational expression.

LESSON 11-2

Practice and Problem Solving: A/B

1. $-6\sqrt{3r}$
2. 256
3. 9
4. $\frac{a^{\frac{5}{2}}b^{\frac{1}{2}}}{b^2}$ or $\frac{a^{\frac{5}{2}}}{b^{\frac{3}{2}}}$
5. 144
6. $\frac{1}{3}$
7. $25x$
8. $\frac{3}{2}$
9. $9x\sqrt[3]{3xy^2}$
10. $25xy\sqrt[3]{4x^2}$
11. a. $I = \frac{g}{4\pi f^2}$; $I = \frac{8}{(\pi f)^2}$

    b. about 3 feet long

Practice and Problem Solving: C

1. x^2y^3
2. $r^{\frac{23}{8}}$
3. $\frac{x^6}{y^3}$
4. $\frac{x}{5}$
5. $4x^{12}y^2$
6. $\frac{y^2x^{\frac{3}{4}}}{x^4}$
7. $4x^6$
8. $27x^3$
9. $\frac{n^3}{m^2}$
10. $-25uv\sqrt[3]{6u^2v^2}$
11. a. $A = V^{\frac{2}{3}}$

    b. $A = V^{\frac{2}{3}} = 9261^{\frac{2}{3}} = \sqrt[3]{9261^2} = \sqrt[3]{85766121} = 441$; Since $441 < 462.25$, the bouncehouse will fit.

Practice and Problem Solving: Modified

1. $2x$
2. $\frac{3}{2}$
3. $2^5 = 32$
4. $9x^2$
5. $5^4 = 625$
6. $\frac{2x}{3}$
7. $\frac{2}{x}$
8. 1
9. $125x^3$
10. $6m\sqrt[3]{2m}$
11. a. $r = \left(\frac{3}{4\pi}\right)^{\frac{1}{3}} V^{\frac{1}{3}}$; $r = 0.62V^{\frac{1}{3}}$

    b. about 3 inches