LESSON 6.1

NAME _____ DATE _____

Practice C

For use with pages 323–328

Use the properties of exponents to evaluate the expression.

1. $\dfrac{2^{-4} \cdot 2^5}{2^{-3}}$

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

3. $\dfrac{(-2)^4(-2)^{-1}}{(-2)^3}$

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

5. $\left[\left(\dfrac{3}{8}\right)^2\right]^2$

6. $\dfrac{\left(\dfrac{1}{3}\right)^{-3}}{\left(\dfrac{1}{3}\right)^4\left(\dfrac{1}{3}\right)^{-2}}$

Simplify the expression.

7. $\dfrac{xy}{4} \cdot \dfrac{2x^2}{y^3}$

8. $\dfrac{-2x^2}{3xy^3} \cdot \dfrac{2x^{-1}}{y^{-1}}$

9. $\dfrac{x^{-4}}{y^{-2}} \cdot \dfrac{y^{-2}}{x^{-4}}$

10. $\dfrac{5x^2y}{8} \cdot \dfrac{-2x^{-1}y}{x^3y}$

11. $\dfrac{(2x^2)^3}{5} \cdot \dfrac{15x^{-2}}{2x^3}$

12. $\left(\dfrac{x^3y^2}{2x^4}\right)^{-2}$

13. $\left(\dfrac{(2x)^3}{2x^3}\right) \cdot 4x^5$

14. $\left(\dfrac{x^2y^5z}{2x^3}\right)^2$

15. $[(x^4)^{-6}]^2$

Use the properties of exponents to simplify the left side of the equation. Then solve the equation as demonstrated below.

$$4^{x-1} = 4^2 \implies x - 1 = 2 \implies x = 3$$

16. $2^x2^3 = 2^5$

17. $\dfrac{3^x}{3^2} = 3^4$

18. $(5^x)^3 = 5^{12}$

19. $\dfrac{4^3}{4^x} = 4^0$

20. $\dfrac{2^{-x}y^2}{y^2} = 2^5$

21. $(-2x)^0(3^2)(3^x) = 3^{-1}$

Class Project **In Exercises 22–26, use the following information.**

Your class project is to design a piece of playground equipment for an elementary school. You design a romper room that will contain small plastic balls for the children to roll around in. The room will be 10 feet by 10 feet. The plastic balls will cover the entire floor to a depth of 2 feet. A toy distributor can ship you 190 balls (each with a radius of $1\frac{3}{4}$ inches) in a cubic box, 20 inches on a side.

22. Find an expression for the volume (in cubic inches) of one ball.

23. Find an expression that represents the ratio of the volume of 190 balls to the volume of the cubic box.

24. What percent of the volume of the cubic box is filled with plastic balls?

25. Find the volume of the region in the romper room that will contain plastic balls. Give your result in cubic inches.

26. Based on the percent of the volume of the cubic box that is filled with plastic balls, how many balls will you need to fill the romper room?