

7-4

Practice B

Form K

Division Properties of Exponents

Simplify each expression.

1. $\frac{3^5}{3^2} = \frac{3 \times 3 \times 3 \times 3 \times 3}{3 \times 3} = 3^{\square}$

2. $\frac{6^7}{6^3}$

3. $\frac{y^7}{y^4}$

4. $\frac{m^4}{m}$

5. $\frac{x^6 y^9}{x^2 y^5}$

6. $\frac{21m^{\frac{3}{2}}}{3m^{\frac{1}{2}}}$

7. $\left[\frac{2}{7}\right]^4 = \frac{2}{7} ? \frac{2}{7} ? \frac{2}{7} ? \frac{2}{7} = \frac{2^4}{7^4} = \frac{\square}{\square}$

8. $\left[\frac{3}{2}\right]^3$

9. $\left[\frac{5x}{3y}\right]^2$

10. $\left[\frac{3x^4}{2y^3}\right]^3$

11. $\left[\frac{2m^{\frac{3}{4}}}{5p}\right]^0$

12. $\left[\frac{xy^3}{x^3y}\right]^2$

13. **Writing** Explain how you divide powers with like bases. Discuss why the bases have to be the same. How are these rules similar to the rules for multiplying powers with like bases?

Explain why each expression is *not* in simplest form.

14. 2^4y^3

15. $(3x)^2$

16. x^3y^0

17. $\frac{y^5}{y}$

Simplify each quotient. Write each answer in scientific notation.

18. $\frac{6 \times 10^7}{3 \times 10^5}$

19. $\frac{2.4 \times 10^3}{8.2 \times 10^2}$

20. **Error Analysis** A student simplifies the expression $\left[\frac{6^4}{3^2}\right]^3$ as follows:

$\left[\frac{6^4}{3^2}\right]^3 = [(6 \div 3)^{4-2}]^3 = (2^2)^3 = 64$. What mistake did the student make in simplifying the expression? What is the correct simplification of the expression?

21. The area of a rectangle is $20x^6y^4$. The length of the rectangle is x^2y^3 . What is the width of the rectangle?

22. **Open-Ended** First simplify the expression $\left[\frac{2m^5}{10m}\right]^2$ by raising each factor in the brackets to the second power then simplify the result. Next simplify by some other method. Explain your method. Are the results the same? Which method do you prefer?