Name _____ Class _____ Date _____

7-4 Practice

Form K

Division Properties of Exponents

Simplify each expression.

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

2. $\frac{6^7}{6^3}$ **6^4**

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

4. $\frac{m^4}{m}$ **m^3**

5. $\frac{x^6y^9}{x^2y^5}$ **x^4y^4**

6. $\frac{21m^{\frac{3}{2}}}{3m^{\frac{1}{2}}}$ **$7m$**

7. $\left[\frac{2}{7}\right]^4 = \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} \times \frac{2}{7} = \frac{2^4}{7^4} = \frac{\square}{\square}$ **$\frac{16}{2401}$**

8. $\left[\frac{3}{2}\right]^3$ **$\frac{27}{8}$**

9. $\left[\frac{5x}{3y}\right]^2$ **$\frac{25x^2}{9y^2}$**

10. $\left[\frac{3x^4}{2y^3}\right]^3$ **$\frac{27x^{12}}{8y^9}$**

11. $\left[\frac{2m^{\frac{3}{4}}}{5p}\right]^0$ **1**

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

7-4 Practice (continued) Form K

Division Properties of Exponents

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?

Answers will vary. Sample: To divide powers with like bases, subtract the exponents. The bases have to be the same because the rule about subtracting the exponents amounts to counting the number of the base that remains. The rule for dividing is similar to the rule for multiplying, but uses subtraction instead of addition.

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

14. 2^4y^3 2^4 can be rewritten as 16.

15. $(3x)^2$ Can be rewritten as $9x^2$.

16. x^3y^0 $y^0 = 1$

17. $\frac{y^5}{y}$ Can be rewritten as y^4.

Simplify each quotient. Write each answer in scientific notation.

18. $\frac{6 \times 10^7}{3 \times 10^5}$ 2×10^4

19. $\frac{2.4 \times 10^3}{8.2 \times 10^2}$ 2.9×10^0

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?

Should not divide 6 by 3. Correct simplification is 144^3 or 2,985,984.

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? $20x^4y$

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?

$\frac{m^8}{25}$; Answers may vary. Results of the second method should match those of the first method.