Name _____ Date _____ Bell _____

Exponents Study Guide

1. $x^3 \cdot x^4 = x^7$ Explain why this is true.

Product Rule → add the exponents

2. $(x^2)^3 = x^6$ Explain why this is true.

Power Rule → mult. the exponents

3. $\frac{x^8}{x^3} = x^5$ Explain why this is true.

Quotient Rule → subtract the exponents

4. $\frac{1}{x^{-3}} = x^3$ Explain why this is true.

Negative Rule → move the (-) exponent and make it positive

5. Simplify each exponent problem. Your answer should contain only **positive exponents**.

6. $7^3 \cdot 7^2$

7^5

7. $(2^4)^3$

2^{12}

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

$\frac{1}{4^4}$

9. $x^9 \cdot x^5$

x^{14}

10. $(x^7)^4$

x^{28}

11. $\frac{x^{12}}{x^6}$

x^6

12. 124^0

1

13. $(2ab^3)^3$

$8a^3b^9$

14. $\frac{10x^7y^3}{8x^4y^4}$

$\frac{5x^3}{4y}$

15. $(4a^2b^3)(5a^5b)$

$20a^7b^4$

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16.

$x^4 \cdot 2x^4$ $2x^8$	$\frac{xy^8}{x^3y^5}$ $\frac{y^3}{x^2}$
$(2x^4)^3 \cdot (3x^2)^2$ $8x^{12} \cdot 9x^4$ $72x^{16}$	$\frac{2y^3 \cdot 6xy^4}{3x^3y^5}$ $\frac{12xy^7}{3x^3y^5}$ $\frac{4y^2}{x^2}$

17. Which fraction is equivalent to f^{-3}?

a. $\frac{1}{f^{-3}}$

b. $\frac{f^3}{-1}$

c. $\frac{1}{f^3}$

d. $\frac{3}{f^3}$

18. Which is equivalent to y^{-1}?

a. $\frac{1}{y^2}$

b. $\frac{1}{y}$

c. $-y$

d. y

19. Which of the following is equivalent to $r \cdot r^4 \cdot r^3 \cdot r^{-5}$?

a. r^2

b. r^3

c. r^7

d. r^{13}

20. Which value is a simplified form of $\frac{x^4}{x^{-4}}$?

a. x^{25}

b. x^8

c. x

d. 1

21. For the next two expressions, write in exponential form and evaluate.

$\frac{(4^2)^3}{(7^3)^2} = \frac{4^6}{7^6} = \frac{1}{3^6} = \frac{1}{729}$ *use calculator

$(2^6 \cdot 2^2)^2$

$2^{12} \cdot 2^4 = 2^{16} = 65536$