

Exponent Rules Review

Name _____

Multiplication

Part 1: Simplify each expression.

1.) $2^3 \cdot 2^4$

$$= 2^7$$

2.) $8^1 \cdot 8^3$

$$= 8^4$$

3.) $t^4 \cdot t^4$

$$= t^8$$

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

$$= x^{14}$$

5.) $3^4 \cdot x^3 \cdot x^5$

$$= 81x^8$$

Part 2: Find the product of the expressions.

6.) $(6x^2)(4x^2)$

$$= 24x^4$$

7.) $(3x^3y^2)(-6y^5)$

$$= -18x^3y^7$$

8.) $(5p^3)(-m^8p^2)$

$$= -5m^8p^5$$

9.) $(10g^3h^8v^6)(11gh^8)$

$$= 110g^4h^{16}v^6$$

10.) $(4f^9h^3)(-5f^6)(-3h^2)$

$$= 60f^{15}h^5$$

11.) $(-2^2x^3y^4)(-3)^2x^4y^4$

$$= (-4x^3y^4)(9x^4y^4) = -36x^7y^8$$

12.) *Challenge: $(3x^a y^b z^c)(-y^f z^g)$

$$= 3x^a y^{b+f} z^{c+g}$$

Power to a Power

Part 1: Find the product. Expand if it helps you.

13.) $(p^2)^5 = p^{10}$

14.) $(x^m)^2 = x^{2m}$

15.) $(2^3x)^2 = 2^6x^2 = 64x^2$

16.) $2(3a^2)^3 = 2(3^3a^6) = 2(27a^6) = 54a^6$

17.) $(2x)^2 = 4x^2$

18.) $(10^2)^3 = 10^6$

19.) $(-3^2x^6)^5 = -3^{10}x^{30}$

20.) $(7j^2)^3 = 7^3j^6 = 343j^6$

21.) $\left(\frac{8x^2}{2x^2}\right)^2 = (4)^2 = 16$

22.) $\left(\frac{3x^2}{2y^2}\right)^5 = \frac{3^5x^{10}}{2^5y^{10}}$

Division

Part 1: Simplify to find the quotients.

$$23.) \frac{a^8}{a^3} = a^5$$

$$24.) \frac{7^{11}}{7^8} = 7^3$$

$$25.) \frac{7 \cdot b^5}{b^4} = 7b$$

$$26.) \frac{x^{10}}{x^4} = x^6$$

$$27.) \frac{12 \cdot g^8 \cdot h^4}{g^3 \cdot h^5} = \frac{12g^5}{h}$$

$$28.) \frac{4 \cdot p^{11}}{8 \cdot p^6} = \frac{p^5}{2}$$

$$29.) \frac{c^9}{6c^4} = \frac{c^5}{6}$$

$$30.) \frac{2 \cdot x^3 y^8}{4 \cdot y^2} = \frac{x^3 y^6}{2}$$

$$31.) \frac{3x^{14}y^{11}}{18x^2} = \frac{x^{12}y^{11}}{6}$$

Good luck

$$32.) \left(\frac{5x^{13}y^5z^2}{3 \cdot 5^2} \right)^0 = 1$$

$$33.) \frac{(2x^3) \cdot (x^4)^2}{8x^{11}} = \frac{2x^3 \cdot x^8}{8x^{11}} = \frac{2x^{11}}{8x^{11}} = \frac{1}{4}$$

$$34.) \left[\frac{(3x^2)^3}{6x^3} \right]^2 = \frac{9^2 x^6}{2^2} = \frac{81x^6}{4}$$
$$= \left(\frac{3^3 x^6}{6x^3} \right)^2$$
$$= \left(\frac{27x^6}{6x^3} \right)^2$$
$$= \left(\frac{9x^3}{2} \right)^2$$

$$35.) \left[\left(\frac{15xy^5}{3x^2y^3} \right) \times \left(\frac{10x^4y}{25xy^2} \right)^2 \right]^3 = \left(\frac{5y^2}{x} \times \left(\frac{2x^3}{5y} \right)^2 \right)^3$$
$$= \left(\frac{5y^2}{x} \times \frac{4x^6}{25y^2} \right)^3 = \left(\frac{4x^5}{5} \right)^3$$
$$= \left(\frac{20x^6y^2}{25xy^2} \right)^3 = \frac{64x^5}{125}$$