

Unit 6 Study Guide - EXPONENT RULES Mixed Review

Directions: Simplify. Answers should only have positive exponents!

PART I: When you multiply like bases, you add the exponents!

1. $m^4 \cdot m^6$

$$m^{10}$$

2. $(4x^2y)(3x^3y^5)$

$$12x^5y^6$$

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

$$4x^2y^0 = 4x^2$$

4. $(x^2y^4z^0)(xyz)$

$$x^3y^5z^1$$

PART II: A product raised to a power, you multiply the exponents!

5. $(x^3)^8$

$$x^{24}$$

6. $(4a^{10})^3$

$$4^3 a^{30} = 64a^{30}$$

7. $(8rs)^4(2r^3s^0)$

$$8^4 r^4 s^4 \cdot 2r^3 s^0$$
$$8192r^7s^4$$

8. $(-2x^3y^{-4})^2$

$$-2^2 x^6 y^{-8} = \frac{4x^6}{y^8}$$

PART III: When you divide like bases, you subtract the exponents!

9. $\frac{c^{20}}{c^5} = c^{15}$

10. $\frac{9x^2}{3x^3} = \frac{3}{x}$

$$11. \left(\frac{2a^{-3}b^4}{4a^3b^0} \right)^3$$

$$\left(\frac{b^4}{2a^6} \right)^3 = \frac{b^{12}}{8a^{18}}$$

$$12. \frac{-3 \cdot 24m^4n^3p^3}{8m^2n^2p^4}$$

$$\frac{-3m^2n}{p}$$

PART IV: When you have a negative exponent, you move the base to the to make the exponent positive!

When you have a base raised to a zero exponent, the answer is always ONE.

$$13. -18x^{-3}y^5 = \frac{-18y^5}{x^3}$$

$$14. \frac{1}{m^{-10}n^5} = \frac{m^{10}}{n^5}$$

$$15. (-3xy^{-5})^{-2} = -3^{-2}x^{-2}y^{10}$$

$$= \frac{y^{10}}{-3^2x^2}$$

$$= \frac{y^{10}}{9x^2}$$

$$16. \frac{(25x^5y^{-13})^0}{33x^{-10}y^{-24}} = \frac{1}{33x^{-10}y^{-24}}$$

$$= \frac{x^{10}y^{24}}{33}$$

For 17-18, can you find the student's error? Correct the student's mistake by simplifying correctly!

$$17. \frac{3^9x^8}{3^7x^5} = 6x^3$$

$$3^2x^3 = 9x^3$$

$$18. (-2x^0y^5)^{-2} = \frac{4}{x^2y^{10}}$$

$$-2^{-2}x^0y^{-10} = \frac{1}{-2^2y^{10}} = \frac{1}{4y^{10}}$$