

Quotient Properties of Exponents

I. Multiplication Properties

A. ex: $3^4 \cdot 3^3 = 3^7$

Same Base = Add Exponents

ex: $9^{-5} \cdot 9^2 = 9^{-3}$

Same Base = Add Exponents

II. Multiplication & Division

A. Inverses (Opposites)

B. Logic

i. Multiply Exponents = Add Exponent

ii. Divide Exponents = Subtract Exponents

ex: $\frac{5^6}{5^2} = \frac{\cancel{5} \cdot \cancel{5} \cdot \overbrace{5 \cdot 5 \cdot 5 \cdot 5}^4}{\cancel{5} \cdot \cancel{5}} = 5^4$

$5^{6-2} = 5^4$

III. Caution w/ Negatives

- 1) write problem out
- 2) same change opposite

ex: $\frac{8^{-2}}{8^5} = 8^{-2} \downarrow \downarrow 5$
 $8^{-2} + (-5)$

$$\boxed{8^{-7}}$$

IV. Fractions

A. Simplify the Fractions

$$\text{ex: } \frac{8 \div 4}{12 \div 4} = \frac{2}{3}$$

$$\text{ex: } \frac{8x^7}{12x^4} \quad \cdot \text{Two Part Question}$$

$$\frac{8}{12} = \frac{2x^3}{3}$$

who has more a's?
Top or Bottom?

$$\text{ex: } \frac{20a^2b^5}{8a^4b^1}$$

$$\frac{20 \div 4}{8 \div 4} =$$

$$\frac{5b^4}{2a^2}$$

$$\frac{\cancel{a} \cdot \cancel{a}}{\cancel{a} \cdot \cancel{a} \cdot a \cdot a} \text{ bottom}$$

Bottom has two more a's