

Exponent Rules fill

Exponent Rules

To apply any of these rules the **BASES** must be the same!

$3 \cdot 3 = 3^2$ ← exponent
 base → often we use exponents on variables m^2

Multiplication Rule

$(m^2)(m^3)$ then the rule must be: Keep the base
 $= m \cdot m \cdot m \cdot m \cdot m$ Add exponents
 $= m^5$

Division Rule

$(m^3) \div (m^2)$ OR $\frac{(m^3)}{(m^2)} = m^1$
 ~~$\frac{m \cdot m \cdot m}{m \cdot m} = \frac{m \cdot m \cdot m}{m \cdot m}$~~ ~~$\frac{m \cdot m \cdot m}{m \cdot m} = \frac{m \cdot m \cdot m}{m \cdot m}$~~
 $\frac{m}{1} = m^1$ $\frac{(m^3)}{(m^2)} = m$
 then the rule must be: Keep the base
Subtract the exponent

Power Rule

$(m^3)^2 = (m \cdot m \cdot m)(m \cdot m \cdot m)$
 $= m^6$
 then the rule must be: Keep the base
Multiply the exponents

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Use exponent rules to simplify:

a. $(m^2)(m^6)$

$= m^8$

b. $(m^3)(m^5)$

$= m^8$

c. $(a^{12}) \div (a^6)$

$\frac{a^{12}}{a^6} = a^6$

d. $(b^2)^4$

$= b^8$

Negative and Zero Exponents

Simplify $\frac{m^5}{m^9}$

$= m^{5-9}$
 $= m^{-4} = \frac{1}{m^4}$

$= \frac{m \cdot m \cdot m \cdot m \cdot m}{m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m \cdot m} = 1$

$m^{-7} = \frac{1}{m^7}$

$m^{-10} = \frac{1}{m^{10}}$

$\frac{m^5}{m^5} = m^{5-5}$
 $= m^0$

Any number to the exponent 0 is the number 1

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Exponent Rules fill

Use exponent rules to simplify:

a. $(m^{16})(m^6)$

$$= m^{22}$$

b. $(m^{-3})(m^5)$

$$= m^2$$

c. $(a^{12}) \div (a^{16})$

$$= a^{12-16}$$

$$= a^{-4}$$

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

d. $(x^{-3})^4$

e. $(2y^3)^4$

Evaluate (best to simplify FIRST)!

a. $(2^2)(2^6)$

b. $(2^2)^3 - (3^2)^2$

c. $(1)^{16} + (1)^{12}$

d. $((5^5) \div (5^3))^0$

e. $\frac{(8^{-2})(8^6)(8^3)}{(8^4)(8^2)}$

Sep 15-10:28 AM

Apply the rules!

Simplify first, then evaluate where possible

→ an actual number

→ one expression

a. $\left(\frac{-3}{5}\right)^4 \times \left(\frac{-3}{5}\right)^5$

$$= \left(\frac{-3}{5}\right)^9 = \left(\frac{-3^9}{5^9}\right)$$

$$= -19683$$

b. $\left(\left(\frac{2}{7}\right)^3\right)^2$

$$= \left(\frac{2}{7}\right)^6$$

$$= \frac{64}{117649}$$

c. $\frac{25x^2y^3 \times 6x^4}{4xy \times 3x^5y}$

$$= \frac{(25)(6)(x^2)(x^4)y^3}{(4)(3)(x)(x^5)(y)(y)}$$

$$= \frac{150 \cancel{x^6} y^3}{12 \cancel{x^6} y^2} = \frac{25(1)y^1}{2(1)}$$

HMWK

W pg. 53 #5ac, 6abc

W pg 55 # 1-8 choose 3 from each

$$= \frac{25y}{2}$$

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