

Get out your homework: Zero and Negative Exponents

Daily HW Check

Zero and Negative Exponents: # 4

Zero and Negative Exponents: # 11



HW Answers are posted on my weebly

Simplify.

$$1) 7^0 = 1$$

$$2) 5x^0 = 5 \cdot 1 = 5$$

$$3) (-2)^0 = 1$$

$$4) -3^0 = -1$$

$$5) 6^0 \cdot 6 = 1 \cdot 6 = 6$$

$$6) 11^{-3} = \frac{11^{-3}}{1} = \frac{1}{11^3}$$

$$7) 5^{-3} = \frac{5^{-3}}{1} = \frac{1}{5^3} \text{ or } \frac{1}{125}$$

$$8) x^{-3} y^4 = \frac{y^4}{x^3}$$

$$9) \frac{a^{-1} b^4}{c^{-3}} = \frac{b^4 c^3}{a}$$

$$10) \frac{3^{-3} a^4}{b^{-2}} = \frac{a^4 b^2}{3^3} = \frac{a^4 b^2}{27}$$

$$11) \frac{a^5 b^{-3} c^{-2}}{d^{-5}} = \frac{a^5 d^5}{b^3 c^2}$$

$$12) \frac{d^2 e^{-3}}{-b^2 f^{-1}} = \frac{d^2 f^1}{-b^2 e^3} = \frac{d^2 f^1}{-36 e^3}$$

Mrs. Ballard

Exponents

- 1) $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
- 2) $3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$
- 3) $(-4) \cdot (-4) \cdot (-4)$
- 4) $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

Examples:
conjugates
+ same
- same

Expanded Form and Exponential Form

Simplifying Powers

Evaluating Expressions

Zero Exponents

Negative Exponents

Multiplying Powers with the same base

Dividing Powers with the same base

$$5^3 \cdot 5^7 =$$
$$5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 = 5^{10}$$

Rule: ① Keep the base
② Add the exponents
Write in exponential form.

$$\text{Ex 1) } 5^4 \cdot 5^5 = 5^{4+5} = 5^9$$

$$\text{Ex 2) } b^{12} \cdot b^{12} = b^{12+12} = b^{24}$$

$$\text{Ex 3) } 16 \cdot 16^{-7} = 16^1 \cdot 16^{-7} = 16^{1+(-7)} = 16^{-6} = \frac{16^{-6}}{1} = \frac{1}{16^6}$$

$$\text{Ex 4) } 4^2 \cdot 3^2 = 16 \cdot 9 = 144$$

$$\text{Ex 5) } a^2 b^4 \cdot a^7 b^3 = a^2 \cdot a^7 \cdot b^4 \cdot b^3 = a^{2+7} b^{4+3} = a^9 b^7$$

$$\text{Ex 6) } 5h y^{-3} \cdot 7h^{-5} y^3 = 5 \cdot 7 \cdot h^1 \cdot h^{-5} \cdot y^{-3} \cdot y^3 = 35 h^{1+(-5)} y^{-3+3}$$
$$= 35 h^{-4} y^0 = \frac{35 y^0}{h^4} = \frac{35 \cdot 1}{h^4} = \frac{35}{h^4}$$

Multiplying Powers with the same base

$$\frac{6^5}{6^3} = \frac{\cancel{6} \cdot \cancel{6} \cdot \cancel{6} \cdot 6 \cdot 6}{\cancel{6} \cdot \cancel{6} \cdot \cancel{6}} = 6^2 = 36$$

Rule: ① Keep the base
 ② subtract the exponents

$$6^{5-3} = 6^2 = 36$$

$$\text{Ex 1) } \frac{6^9}{6^4} = 6^{9-4} = 6^5$$

$$\text{Ex 5) } \frac{x^{-3}}{x^5}$$

* Change position of negative exponents first!

$$\text{Ex 2) } \frac{b^m}{b^n} = b^{m-n}$$

$$x^{-3} \cdot x^5 = \frac{1}{x^3} \cdot x^5 = \frac{1}{x^8}$$

rule

$$\text{Ex 3) } \frac{10^8}{10^5} = 10^{8-5} = 10^3$$

$$\text{Ex 6) } \frac{4d^{-2}g^5}{2d^6g^{-4}}$$

$$\left. \begin{array}{l} x^{-3-5} \\ x^{-8} \\ \frac{1}{x^8} \end{array} \right\}$$

$$\text{Ex 4) } \frac{x^4}{x^9} = x^{4-9} = x^{-5} = \frac{1}{x^5}$$

$$\frac{4\cancel{d}^2g^5}{2d^6\cancel{g}^{-4}} = \frac{4g^5g^4}{2d^2d^6} = \frac{2g^9}{d^8}$$

Dividing Powers with the same base

HW: Multiplying and Dividing Exponents Worksheet All