

Zero & Negative Exponents

9/22

Zero Exponents

Anything raised to the **Zero**
power equals 1

Here's Why:

$$\frac{4^2}{4^2} = \frac{16}{16} = 1$$

$$\frac{4^2}{4^2} = 4^0 = 1$$

$$5^0 = 1 \quad x^0 = 1$$

$$(2x)^0 = 1 \text{ vs. } 2x^0 = 2 \cdot \boxed{2}$$

$$\frac{x^2}{x^2} = \frac{\cancel{x} \cdot \cancel{x}}{\cancel{x} \cdot \cancel{x}} = \boxed{x^0 = 1}$$

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Negative Exponents

Negative Exponents represent a Fraction Where the denominator is raised to a positive exponent.

$$10^3 = 1,000 \quad \downarrow \div 10$$

$$10^2 = 100 \quad \downarrow \div 10$$

$$10^1 = 10 \quad \downarrow \div 10$$

$$10^0 = 1 \quad \downarrow \div 10$$

$$10^{-1} = 0.1 \quad \downarrow \div 10 \quad 0.1 = \frac{1}{10}$$

$$10^{-2} = 0.01 \quad \downarrow \div 10 \quad \frac{1}{100} = \frac{1}{10^2}$$

$$10^{-3} = 0.001 \quad \downarrow \div 10 \quad \frac{1}{1000} = \frac{1}{10^3}$$

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Practice - Rewrite w/ positive exponents

$$\textcircled{1} \frac{1}{7^{-2}} = \frac{1}{7^2}$$

$$\textcircled{2} \frac{1}{b^{-4}} = \frac{1}{b^4}$$

****Think****

- Positive Powers stay Put
- Negatives Navigate

$$\textcircled{3} \frac{1}{x^{-2}} = x^2$$

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Practice - Rewrite w/ positive exponents

$$\textcircled{4} \frac{a^5}{b^{-2}} = a^5 b^2$$

$$\textcircled{5} \frac{m^2}{1} \cdot n^{-2} = \frac{m^2}{n^2}$$

$$\textcircled{6} \frac{4a}{5b^{-2}} = \frac{4ab^2}{5}$$

$$\textcircled{7} \frac{4a^{-1}}{5b^2} = \frac{4}{5ab^2}$$

$$\frac{7a}{5b^2} \cdot a^{-1} = \frac{1}{5ab^2}$$

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on own

$$\textcircled{1} \quad \frac{3x^2}{2y^{-3}} \quad \frac{3x^2y^3}{2} \quad \textcircled{2} \quad \frac{3a^2b^{-3}}{1} \quad \frac{3a^2}{b^3}$$

$$a^{-3} \cdot a^2 = a^{-1} = \frac{1}{a^1}$$

$$a^3 \cdot a^{-2} = a^1$$

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