

JANUARY 23, 2012

ALGEBRA 2

IS THERE ANYTHING THAT NEEDS TO BE CORRECTED?

1/23 - Properties of Exponents

1. Product of Powers Property

$$a^m \cdot a^n = a^{m+n}$$

$$x^2 \cdot x^3 = x^5$$
$$x \cdot x \cdot x \cdot x \cdot x$$

$$2n^2 \cdot 3n^5$$
$$= 6n^7$$

2. Power of a Power Property

$$(a^m)^n = a^{mn}$$

$$(x^2)^3 = x^6$$

$x^2 \cdot x^2 \cdot x^2$

$$(3n^4)^2 = 9n^8$$

3. Power of a Product Property

$$(ab)^n = a^n b^n$$

$$(x^2 y^3)^4 = x^8 y^{12}$$

$$(2n^4)^3 = 8n^{12}$$

$$\begin{aligned}
2^3 &= 8 \\
2^2 &= 4 \\
2^1 &= 2 \\
2^0 &= 1 \\
2^{-1} &= \frac{1}{2} \\
2^{-2} &= \frac{1}{4} \\
2^{-3} &= \frac{1}{8}
\end{aligned}$$

4. Negative Power Property

$$a^{-n} = \frac{1}{a^n} \text{ if } a \neq 0$$

$$\begin{aligned}
& x^{-2} & \frac{1}{n^{-3}} \\
= & \frac{1}{x^2} & = n^3
\end{aligned}$$

$$\frac{3x^{-2}y^3}{z^{-4}} = \frac{3y^3z^4}{x^2}$$

5. Zero Power Property

$$a^0 = 1 \text{ if } a \neq 0$$

$$1^0 = 1$$

$$3^0 = 1$$

$$\left(\frac{-3x^2y^{-3}}{4z^{-5}} \right)^0 = 1$$

$$-2^0 = -1$$

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

6. Quotient of Powers Property

$$\frac{a^m}{a^n} = a^{m-n} \text{ if } a \neq 0$$

$$\frac{x^4}{x^2} = x^{4-2} = x^2$$

$$\frac{\cancel{n^3}}{\cancel{n^7}} = n^{3-7} = n^{-4} = \frac{1}{n^4}$$
$$= \frac{1}{n^4}$$

7. Power of a Quotient Property

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n} \text{ if } b \neq 0$$

$$\left(\frac{x^2}{y^3}\right)^4 = \frac{x^8}{y^{12}}$$

$$\left(\frac{2x^3}{y}\right)^{-2} = \left(\frac{y}{2x^3}\right)^2 = \frac{y^2}{4x^6}$$

Simplify completely - no negative exponents

$$\begin{aligned} & [(-2)^3]^3 \\ &= (-2)^9 \\ &= -512 \end{aligned}$$

$$\begin{aligned} & (3^{-2})^2 \\ &= 3^{-4} \\ &= \frac{1}{3^4} \\ &= \frac{1}{81} \end{aligned}$$

$$\begin{aligned} & \left(\frac{2}{3}\right)^{-2} \\ &= \left(\frac{3}{2}\right)^2 \\ &= \frac{9}{4} \end{aligned}$$

$$= \frac{\frac{4x^2y}{2} \cdot \frac{5x^3y}{4y}}{10x^2y^3} = \frac{2x^4y}{y}$$

$$= \frac{\frac{-2a^2b^3}{3} \cdot \frac{5ab^4a^3}{6a^3}}{3ab^2b^3} = \frac{-5a^5}{9b}$$

HOMEWORK

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DUE Thursday