

09/25/23 : Exponents

25-06

CAA OPENS! Attempt everyday

- on canvas
- 16/20 to pass
- 1 attempt

AW Due 18 1a 20
Wen Fri Sun

Multiplication \leftrightarrow repeated addition
Exponents \leftrightarrow repeated multiplication

~~Defn~~ ~~Defn~~

Defn

$$\underbrace{x + x + x + \dots + x}_{n\text{-times}} = n \times \text{mult.}$$

$$\underbrace{x \cdot x \cdot x \cdot \dots \cdot x}_{n\text{-times}} = x^n. \text{ Exp.}$$

Ex: $2^4 = 2 \cdot 2 \cdot 2 \cdot 2 = 16$

~~$4^4 = 4 \cdot 4 \cdot 4 \cdot 4$~~
 $4^4 = \underbrace{4 \cdot 4 \cdot 4 \cdot 4}_{4\text{ times}}$

$$4^3 = 4 \cdot 4 \cdot 4 = 64$$

Rules for exponents

$$1 = \frac{x^n}{x^n} = x^{n-n} = x^0$$

Product

$$1) x^m \cdot x^n = x^{m+n}$$

Power

$$2) (x^m)^n = x^{m \cdot n}$$

$$3) \left(\frac{x}{y}\right)^m = \frac{x^m}{y^m}$$

$$4) x^{-n} = \frac{1}{x^n}$$

$$5) \frac{1}{x^{-n}} = x^n$$

$$2) \frac{x^m}{x^n} = x^{m-n}$$

$$4) (xy)^n = x^n y^n$$

$$6) x^0 = 1$$

~~8) $\frac{x^m}{x^n} = \frac{x^m}{x^n}$~~

~~Ex~~

Examples: Workbook.

How to ~~say~~ simplify radicals $\sqrt[n]{\text{number}}$

$$\text{Rule: } \sqrt{x^n y} = x \sqrt{y}$$

Ex # d) ~~1000~~ $\sqrt{300}$

$$300 = 10 \cdot 30 = 5 \cdot 2 \cdot 2 \cdot 15 = 5 \cdot 2 \cdot 2 \cdot 5 \cdot 3$$

$$\sqrt{300} = \sqrt{5 \cdot 2 \cdot 2 \cdot 5 \cdot 3} = 2 \sqrt{5 \cdot 5 \cdot 3} = \boxed{10\sqrt{3}}$$

$$e) \sqrt[3]{108} = \sqrt[3]{54 \cdot 2} = \sqrt[3]{27 \cdot 2 \cdot 2} = \sqrt[3]{3 \cdot 3 \cdot 3 \cdot 2 \cdot 2} = \sqrt[3]{4}$$

Can apply same technique to variables