Review: Exponents

Wednesday, November 12, 2014
10:08 AM

$x^5 = x \cdot x \cdot x \cdot x \cdot x$

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

when bases (identical) multiply, exponents add

note: $x^3 + x^2 \neq x^5$

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

raising a power to a power: multiply the exponents

rules: $x^a \cdot x^b = x^{a+b}$

$(x^a)^b = x^{ab}$

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

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

$\frac{1}{v^{-4}} = v^4$

rule: $x^{-n} = \frac{1}{x^n}$

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

$$x^0 = 1$$

$$\frac{x^5}{x^3} = x^2 \qquad \text{why?} \qquad \frac{x \cdot x \cdot x \;\; x \cdot x}{x \cdot x \cdot x}$$

rule $\dfrac{x^a}{x^b} = x^{a-b}$

$$x^{1/2} = \sqrt{x}$$

$$x^{1/3} = \sqrt[3]{x}$$

$$x^{1/a} = \sqrt[a]{x}$$

$$x^{b/a} = \sqrt[a]{x^b} = \left(\sqrt[a]{x}\right)^b$$

$$27^{4/3} = \sqrt[3]{27^4} = \left(\sqrt[3]{27}\right)^4 = 3^4 = 81$$

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

$(xy)^3 = x^3y^3$ but $(x+y)^3 \neq x^3+y^3$