Section S.2: The Power Rules

Monday, October 28, 2013 9:30 AM

$$(x^{\lambda})^{3} = x^{2} \cdot x^{2} \cdot x^{2} = x^{6}$$

raising a power to a power:

$$(a^m)^n = a^{m \cdot n}$$

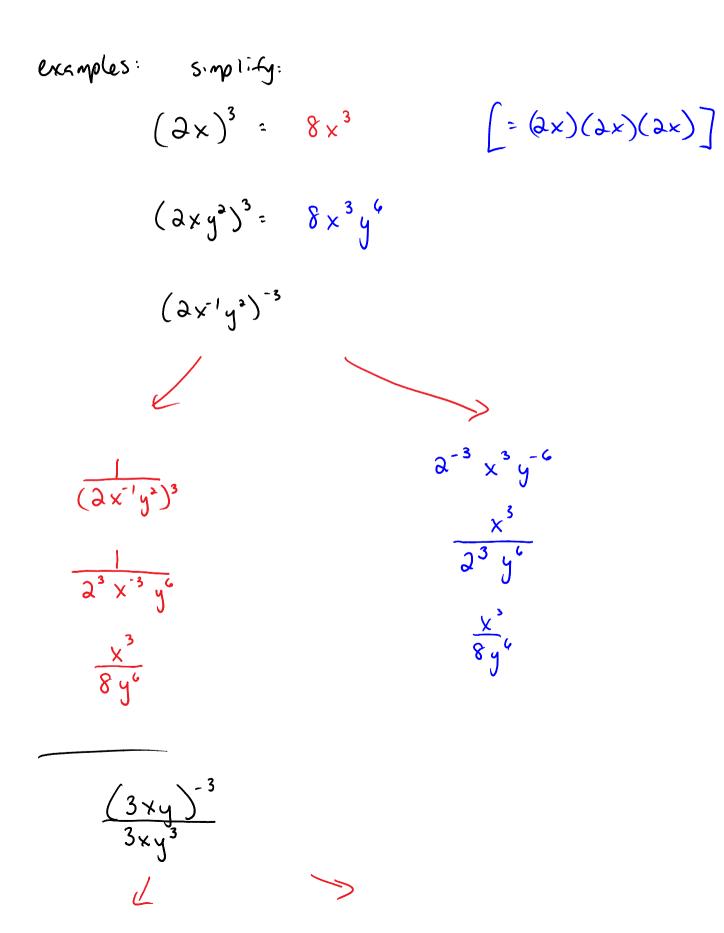
$$examples: simplify:
(x-a)7 = x-14 ar $\frac{1}{x^{14}}$
(x^{-a})³(x⁻³)^{-a} = x⁻⁶ x⁶ = x⁰ = 1
 $\frac{(a^{3})^{-3}}{(a^{-a})^{-1}} = \frac{a^{-6}}{a^{-8}} = a^{2}$$$

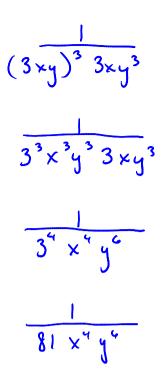
power of a product:
$$(ab)^n = a^n b^n$$

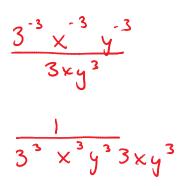
$$NOTE:$$

 $(a+b)^n \neq a^n+b^n$









raising a quatrent to a power: $\left(\frac{q}{b}\right)^n = \frac{a^n}{b^n}$ $\left(\frac{q}{b}\right)^n = \left(\frac{b}{a}\right)^n = \frac{b^n}{a^n}$

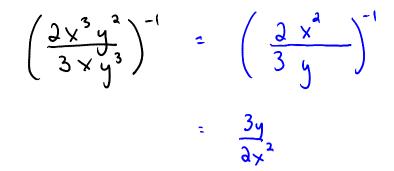
examples: simplify

$$\left(\frac{ab^{-3}}{a^{2}b}\right)^{-2} = \left(\frac{a^{2}b}{ab^{-3}}\right)^{2}$$

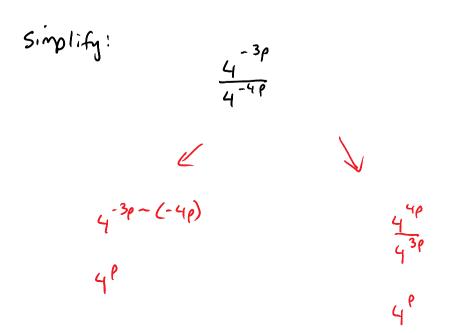
$$= \frac{a^{4}b^{2}}{a^{2}b^{-6}}$$

$$= a^{2}b^{2}b^{6}$$

$$= a^{2}b^{8}$$



$$\frac{(3x^{-1}y^{3})^{-2}}{(3xy^{-1})^{3}} \cdot (9x^{-9}y^{5}) = \frac{3^{-2}x^{-2}y^{-2}}{3^{3}x^{3}y^{-3}} \cdot 9x^{-9}y^{5}$$
$$= \frac{x^{4}y^{3}}{3^{3}z^{2}x^{3}y^{6}} \cdot \frac{9y^{5}}{x^{9}}$$
$$= \frac{3^{4}x^{2}y^{8}}{3^{5}z^{4}x^{19}y^{6}}$$
$$= \frac{y^{2}}{27x^{10}}$$



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