

Feb. 22, 2018

Warmup

$$\frac{(3^2 x^3 y^4)^3 (3^1 x^3 y^{-2})^4}{(3^5 x^6 y^{-2})^2}$$

$$= \frac{3^6 x^9 y^{12} 3^4 x^{12} y^{-8}}{3^{10} x^{12} y^{-4}}$$

$$= \frac{3^{10} x^{21} y^4}{3^{10} x^{12} y^{-4}}$$

$$= 3^{10-10} x^{21-12} y^{4-(-4)}$$

$$= 3^0 x^9 y^8$$

$$= \boxed{x^9 y^8}$$

Distributive Law

We multiply everything outside the brackets by everything inside the brackets.

$$a) \quad 3(2x + 5)$$

multiply coefficients by
coefficients and letters by
letters

$$= 6x + 15$$

$$b) -2(4a - 3b + c - 4d)$$

$$= -8a + 6b - 2c + 8d$$

$$c) 3x(4x + 5)$$

$$= 12x^2 + 15x$$

$$\begin{aligned}d) & -4x(3x-2) + 5(2x+5) \\ & = -12x^2 + 8x + 10x + 25 \\ & = \boxed{-12x^2 + 18x + 25}\end{aligned}$$

$$\begin{aligned}e) & -2x(3x^2-9) + 5x(x^2-2x) \\ & = -6x^3 + 18x + 5x^3 - 10x^2 \\ & = -6x^3 + 5x^3 - 10x^2 + 18x \\ & = \boxed{-1x^3 - 10x^2 + 18x}\end{aligned}$$

$$\text{set } x = -3$$

$$- (-3)^3 - 10(-3)^2 + 18(-3)$$

$$- (-27) - 10(9) - 54$$

$$27 - 90 - 54$$

$$-117$$

$$f) -3(2x - 5(3x - 2))$$

$$= -3(2x - 15x + 10)$$

$$= -3(-13x + 10)$$

$$= \boxed{39x - 30}$$

$$g) \quad 5mn(3m - 5n + 6p)$$

$$= 15m^2n - 25n^2m + 30mnp$$

$$h) \frac{3}{4}x \left(\frac{1}{2}x - \frac{2}{3} \right)$$

$$= \frac{3}{8}x^2 - \frac{6}{12}x$$

$$= \frac{3}{8}x^2 - \frac{1}{2}x$$

$$i) -\frac{2}{3} \left(\frac{4}{1}x - \frac{1}{2} \right) + \frac{2}{5} \left(\frac{1}{2}x - \frac{3}{4} \right)$$

$$= -\frac{8}{3}x + \frac{2}{6} + \frac{2}{10}x - \frac{6}{20}$$

$$= -\frac{8}{3}x + \frac{1}{3} + \frac{1}{5}x - \frac{3}{10}$$

$$= \underbrace{-\frac{8}{3}x + \frac{1}{5}x}_{\text{}} + \underbrace{\frac{1}{3} - \frac{3}{10}}_{\text{}}$$

$$= -\frac{40}{15}x + \frac{3}{15}x + \frac{10}{30} - \frac{9}{30}$$

$$= \boxed{-\frac{37}{15}x + \frac{1}{30}}$$

Extra Q

$$1) \frac{(4x^2y^{-3})^4 (4^{-6}xy^3)^3}{(4^8xy^6)^3 (4^2x^3y^7)^4}$$

$$2) 3x(4x-3) - 4(2x^2-6x-3)$$

3) It costs \$18 for adults and \$15 for kids to go to Wizard of Oz. Make an equation and show the profit if 234 adults and 114 kids.

$$4) \frac{2}{3}x \left(\frac{3}{5}x + 1 \right) - 4 \left(\frac{2}{3}x - \frac{1}{2} \right)$$

$$5) 2^4 x^2 3^4 x^9$$

$$2^4 3^4 x^{11}$$