

Review

$$\text{Simplify: } \frac{2x^{-5}y^4}{3x^2y} \cdot \frac{3^{-2}xy^3}{2^3x} = \frac{2y^{4-1}}{3x^{2-(-5)}} \cdot \frac{y^3}{2^3 \cdot 3^2}$$

$$= \frac{2y^3y^3}{3x^7 \cdot 8 \cdot 9} = \frac{y^6}{108x^7}$$

Find the equation of the line passing through the points

(5, -3) &amp; (-1, 1).

$$m = \frac{-3-1}{5-(-1)} = \frac{-4}{6} = -\frac{2}{3}$$

$$y - y_1 = m(x - x_1)$$

$$y - 1 = -\frac{2}{3}(x + 1)$$

$$y - 1 = -\frac{2}{3}x - \frac{2}{3}$$

$$y = -\frac{2}{3}x + \frac{1}{3}$$

5.3 Multiplication of PolynomialsDistributive Property:  $a(b + c) = ab + ac$  $a(b + c + d + e + f) = ab + ac + ad + ae + af$ Multiplying a Polynomial by a Monomial $-3xy^2(2x^3y - xy^4 + 4x^3y^2)$ 

$$(-3xy^2)(2x^3y) + (-3xy^2)(-xy^4) + (-3xy^2)(4x^3y^2)$$

$$-6x^4y^3 + 3x^2y^6 - 12x^4y^4$$

In general, multiply every term by every other term and then combine like terms.

$$(3x^5 - 2x^3 + 3)(4x^2 - 5x)$$

$$(3x^5)(4x^2) + (3x^5)(-5x) + (-2x^3)(4x^2) + (-2x^3)(-5x) + 3(4x^2) + 3(-5x)$$

$$12x^7 - 15x^6 - 8x^5 + 10x^4 + 12x^2 - 15x$$

Lead term:  $12x^7$  degree: 7  
 Leading coeff: 12 constant term: 0

$$(2x - 3 + 4x^2)(5x^3 - x^8 + 2x)$$

$$2x(5x^3) + 2x(-x^8) + 2x(2x) + (-3)(5x^3) + (-3)(x^8) + (-3)(2x) +$$

$$+ 4x^2(5x^3) + 4x^2(-x^8) + 4x^2(2x)$$

$$= 10x^4 - 2x^9 + 4x^2 - 15x^3 - 3x^8 - 6x + 20x^5 - 4x^{10} + 8x^5$$

$$= -4x^{10} - 2x^9 - 3x^8 + 20x^5 + 10x^4 - 7x^3 + 4x^2 - 6x$$

Multiplying Two Binomials (FOIL Method)

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

$$x^3 - 4x^2 + 3x^2 - 12x$$

$$x^3 - x^2 - 12x$$

F O I L  
 f i r s t  
 + s i d e  
 i n s i d e  
 l a s t

Special Cases:

$$(a + b)(a - b) = a^2 - ab + ab - b^2 = a^2 - b^2$$

$$(a + b)^2 = (a + b)(a + b) = a^2 + ab + ab + b^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = (a - b)(a - b) = a^2 - ab - ab + b^2 = a^2 - 2ab + b^2$$

$\neq a^2 + b^2$   
 $\neq a^2 - b^2$

$$(a + b)(a - b) = a^2 - b^2$$

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

Book Problems from section 5.3:

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

26.  $a^{n+4}(a^{n-2} + 5a^2 - 3)$

$$a^{n+4} a^{n-2} + a^{n+4} (5a^2) + a^{n+4} (-3)$$

$$a^{2n+2} + 5a^{n+6} - 3a^{n+4}$$

50.  $(2a^n - b^n)(3a^n + 2b^n)$

$$(2a^n)(3a^n) + (2a^n)(2b^n) + (-b^n)(3a^n) + (-b^n)(2b^n)$$

$$6a^{2n} + 4a^n b^n - 3a^n b^n - 2b^{2n} = 6a^{2n} + a^n b^n - 2b^{2n}$$

66.  $(x^n + y^n)(x^n - 2x^n y^n + 3y^n)$

$$x^n x^n + x^n (-2x^n y^n) + x^n (3y^n) + y^n x^n + y^n (-2x^n y^n) + y^n (3y^n)$$

$$= x^{2n} - 2x^{2n} y^n + 3x^n y^n + x^n y^n - 2x^n y^{2n} + 3y^{2n}$$

$$= x^{2n} - 2x^{2n} y^n + 4x^n y^n - 2x^n y^{2n} + 3y^{2n}$$

Simplify.

108.  $\frac{(2x + 1)^5}{(2x + 1)^3}$

116.  $[x + (y + 1)][x - (y + 1)]$

126. Find  $(3n^4)^3$  if  $5(n - 1) = 2(3n - 2)$ .

Recommended textbook problems:

5.1 #63-85 odd

5.2 #3-7odd, 15-25odd, 35-49odd

5.3 #25-29odd, 43-51odd, 61-67odd, 89-97odd, 109-117odd