Name _____ MTH 098 – Introduction to Algebra
Date _____ Class #18

Chapter 5 – Multiplication of Monomials

Quality – Accuracy – Transfer – 100%

Section 1. Monomial × Monomial

1. Use rules of signs and product rule for different powers of the same base.

a. $(2x^2)(-3x^3)$ $-6x^5$

b. $(-2y^4)^3(-6y^7)$ $+48y^{19}$

$(-2y^4)(-2y^4)(-2y^4)(-6y^7)$

c. $(2x^2y)(-5xy^3)$ $-10x^3y^4$

d. $6x^2y(-3x^5y^4)^2$ $+54x^{12}y^9$

$6x^2y(-3x^5y^4)(-3x^5y^4)$

e. $(-4x^4y^9)(-3xy^7z^3)$ $+12x^5y^{16}z^3$

f. $6x^2y^3 \cdot 3x^4y$ $18x^6y^4$

2. Use the Distributive Property to Multiply the Monomial × the Polynomial.

a. $3(x-4)$ $3x-12$

b. $-4p(-3p+6)$ $+12p^2-24p$

c. $(x^2-x-1)x$ x^3-x^2-1x

Rewrite $x^1(x^2-x-1)$ x^3-x^2-x

Consideration of the Fractional Multiplier Back it Up

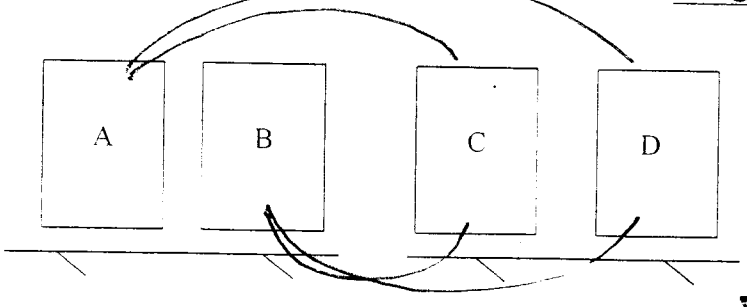
d. $-\frac{1}{2}x(2x^2+4x-6)$ $-x^3-2x^2+3x$

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

Section 2. **A SPECIAL PRODUCT FORMULA.**

It's Friday night, and you wish to rent a couple of videos from Blockbuster for the weekend. When you walk into the store they have a display. 2 for the price of 1 for the weekend. There are 2 shelves with 2 videos on each. You can take a video from each shelf (one only), and you can rent them 2 for 1.

How many different combinations of ~~selections do you have~~? $2 \times 2 = 4$



First: AC

Outside: AD

Inside: BC

Last: BD

FOIL

3. Multiplying a Binomial by a Binomial – Using a Special Case: FOIL

a. $(x + 5)(x + 2)$

$x^2 + 2x + 5x + 10$

$x^2 + 7x + 10$

b. $(x - 5)(x - 3)$

$x^2 - 3x - 5x + 15$

$x^2 - 8x + 15$

c. $(x - 4)(x + 5)$

$x^2 + 5x - 4x - 20$

$x^2 + 1x - 20$

d. $(x + 7)(x - 3)$

$x^2 - 3x + 7x - 21$

$x^2 + 4x - 21$

e. $(x + 5)(x - 5)$

$x^2 - 5x + 5x - 25$

$x^2 - 25$

f. $(x - 7)(x + 7)$

$x^2 + 7x - 7x - 49$

$x^2 - 49$

g. $(2x + 5)(3x - 2)$

$6x^2 - 4x + 15x - 10$

$6x^2 + 11x - 10$

h. $(5x - 1)(5x + 1)$

$25x^2 + 5x - 5x - 1$

$25x^2 - 1$

Expand

i. $(x+6)^2$ $(x+6)(x+6)$

$x^2+6x+6x+36$

$x^2+12x+36$

j. $(3x-4)^2$ $(3x-4)(3x-4)$

$9x^2-12x-12x+16$

$9x^2-24x+16$

EXTRA SECTION:

Multiplication of Longer Polynomials: "Old School"

a. $(2x^2+5x-7)(3x+2)$

$6x^3+4x^2+15x^2+10x-21x-14$

$6x^3+19x^2-11x-14$

b. $(2x+5)(3x^2+2x-5)$

$6x^3+4x^2-10x+15x^2+10x-25$

$6x^3+4x^2+15x^2-10x+10x-25$

$6x^3+19x^2-25$

Section 3. Multiplication of Polynomails – the "Follow The Path" Method. **Old School Section (6/12)**

5. Consider Multiplication of any two Polynomials.

$(x^2+5x+6)(2x+3)$

x^2+5x+6

$2x \quad +3$

$2x^3+10x^2+12x$

$+3x^2+15x+18$

$2x^3+13x^2+27x+18$

a. $(5d^2+1)(3d-1)$

$5d^2+1$

$3d \quad -1$

$15d^3+3d-5d^2-1$

$15d^3-5d^2+3d-1$

b. $(6x - 1)(3x^2 - 2x + 5)$

$3x^2 - 2x + 5$

$6x \quad -1$

$18x^3 - 12x^2 + 30x$

$-3x^2 + 2x - 5$

$18x^3 - 15x^2 + 32x - 5$

c. $(2x + 3)^3$

$(2x+3)(2x+3)(2x+3)$

$4x^2 + 6x + 6x + 9$

$(4x^2 + 12x + 9)(2x+3)$

$4x^2 + 12x + 9$

$2x + 3$

$8x^3 + 24x^2 + 18x$

$+ 12x^2 + 36x + 27$

$8x^3 + 36x^2 + 54x + 27$

Section 4. Division of Polynomials.

1. Division of a Polynomial by a monomial: Key Idea:

Each monomial is the Original LCD between Polynomial Terms

a. $\dfrac{10x^2 - 4x}{2x}$ $5x - 2$

$\dfrac{10x^2}{2x} \quad \dfrac{-4x}{2x}$

b. $\dfrac{2x + 16}{2}$ $x + 8$

$\dfrac{2x}{2} \quad + \dfrac{16}{2}$

c. $\dfrac{12y^3z + 18y^2z^2}{6xy}$

$\dfrac{12y^3z}{6xy} \quad + \dfrac{18y^2z^2}{6xy}$

$\dfrac{2y^2z}{x} + \dfrac{3yz^2}{x}$

d. $\dfrac{15x^3 + 10x^2 - 5x}{5x}$ $3x^2 + 2x - 1$

$\dfrac{15x^3}{5x} \quad + \dfrac{10x^2}{5x} \quad - \dfrac{5x}{5x}$

2nd Idea: Not Every Term divides Nicely

a. $\dfrac{4t^5 - 6t^4 + 8t - 3}{2t^3}$ $\dfrac{2t^3}{2t^2} - \dfrac{3t^2}{2t^2} + \dfrac{4}{t} - \dfrac{3}{2t^2}$

$\dfrac{4t^5}{2t^3} - \dfrac{6t^4}{2t^3} + \dfrac{8t}{2t^3} - \dfrac{3}{2t^3}$

$2t^2 - 3t + 4t^{-1} - 3t^{-3}$

b. $\dfrac{3x^3 - 6x^2 + 4x - 1}{-3x}$

$\dfrac{3x^3}{-3x} \quad - \dfrac{6x^2}{-3x} \quad + \dfrac{4x}{-3x} \quad - \dfrac{1}{-3x}$

$-x^2 + 2x - \dfrac{4}{3} + \dfrac{1}{3x}$

Homework Section:

Section / Pages	Pages / Topics	Problems
5.5	327 → 328	9 → 97 EOO*
5.6	335	17 → 41 Odd