

LESSON #1: MULTIPLYING POLYNOMIALS

Do Now :

1) Multiply:

$$\begin{array}{l} (x+8)(x+7) \\ x^2 + 7x + 8x + 56 \\ \hline x^2 + 15x + 56 \end{array}$$

2) Given the following polynomial:

a) What is the degree? (Highest exponent)

4

b) What is the constant (y-intercept)?

-7 where it crosses y-axis

QUARTIC

CUBIC

QUADRATIC

LINEAR

CONSTANT

Standard form

$$P(x) = 2x^4 - 8x^3 - 5x^2 + 4x - 7$$

c) Try to continue labeling each term according to the "degree".

AIM: MULTIPLYING POLYNOMIALS

1) Multiply $(x^2 + 3x + 1)(x^2 - 5x + 2)$

	x^2	$+3x$	$+1$
x^2	x^4	$3x^3$	x^2
$-5x$	$-5x^3$	$-15x^2$	$-5x$
$+2$	$2x^2$	$6x$	2

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

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

	x^2	$+3x$	$+1$	
x^4	x^4	$3x^3$	x^2	x^2
$3x^3$	$0x^3$	$0x^2$	$0x$	$+0x$
$-1x^2$	$-2x^2$	$-6x$	-2	-2

**PUT IN 0 TERMS THAT ARE MISSING "IN BETWEEN" IF USING THE TABULAR METHOD

$$x^4 + 3x^3 - 1x^2 - 6x - 2$$

Practice: Perform the indicated operation. Simplify each expression.

1) $(x^2 - y^2)(x^2 + y^2) \rightarrow$ conjugate \rightarrow

$$\begin{array}{r} x^4 + x^2 y^2 - x^2 y^2 - y^4 \\ \hline x^4 - y^4 \end{array}$$

2) $(x^3 - 5x + 8) + (x^2 + 6x - 5)$

$$\boxed{x^3 + x^2 + x + 3}$$

3) $(x^2 - 3x + 9)(x^2 + 3x + 9)$

	x^2	$-3x$	$+9$
x^2	x^4	$-3x^3$	$+9x^2$
$+3x$	$3x^3$	$-9x^2$	$+27x$
$+9$	$+9x^2$	$-27x$	$+81$

$$x^4 + 0x^3 + 9x^2 + 0x + 81$$

$$\boxed{x^4 + 9x^2 + 81}$$

4) $(x-4)^3$

$$(x-4)(x-4)(x-4)$$

$$x^2 - 4x - 4x + 16$$

$$(x^2 - 8x + 16)(x-4)$$

$$x^2 - 8x + 16$$

x	x^3	$-8x^2$	$+16x$
-4	$-4x^2$	$+32x$	-64

$$\boxed{x^3 - 12x^2 + 48x - 64}$$

5) $n(n+1)(n+2)$

$$(n^2 + n)(n+2)$$

$$n^3 + 2n^2 + n^2 + 2n$$

$$\boxed{n^3 + 3n^2 + 2n}$$

6) $x^3(x+6)+9$

$$\boxed{x^4 + 6x^3 + 9}$$

7) $(x+1)(x^7 - x^6 + x^5 - x^4 + x^3 - x^2 + x - 1)$

$$(x^8 + x^7 + x^6 - x^5 + x^4 - x^3 + x^2 - x) + (x^7 - x^6 + x^5 - x^4 + x^3 - x^2 + x - 1)$$

$$\boxed{x^8 - 1}$$

LAB #1: MULYIPLYING POLYNOMIALS

Perform the indicated operation. Simplify each expression.

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

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

$x^3 - x^2 - 8x + 12$

2) $(3m^3 + m^2 - 2m - 5)(m^2 - 5m - 6)$

	$3m^3$	$+m^2$	$-2m$	-5
m^2	$3m^5$	$+m^4$	$-2m^3$	$-5m^2$
$-5m$	$-15m^4$	$-5m^3$	$+10m^2$	$+25m$
-6	$-18m^3$	$-6m^2$	$+12m$	$+30$

$3m^5 - 14m^4 - 25m^3 - m^2 + 37m + 30$



3) $(3z^2 - 8)(3z^2 + 8)$ * conjugate *

$$9z^4 + 24z^2 - 24z^2 - 64$$

$$\boxed{9z^4 - 64}$$

4) $(x+2)^3$

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

$$x^2 + 2x + 2x + 4$$

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

$$x^2 + 4x + 4$$

x	x^3	$+ 4x^2$	$+ 4x$
+2	$+ 2x^2$	$+ 8x$	$+ 8$

$$\boxed{x^3 + 6x^2 + 12x + 8}$$

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

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

$$\boxed{x^3 - 2x^2 + x - 4}$$

6) a. Given the accompanying table, determine what type of relationship does the set of ordered pairs (x, y) satisfy? Explain how you know.

x	y
0	1
1	4
2	7
3	10
4	13
5	16

Linear b/c first difference is constant.

b. What is the y-intercept?

Where $x=0$

$$y\text{-int} = \boxed{1}$$

c. What are the coordinates of the y-intercept?

$$(x, y) \rightarrow (0, 1)$$