

AIM: HOW DO WE MULTIPLY POLYOMIALS?

Do Now:

1) Multiply: $2(x+7) = \boxed{2x+14}$ * distribute to both terms! *

2) Match the following words to the appropriate definitions

1. <u>B</u> Degree	<input checked="" type="checkbox"/> a. A single number or variable or number/variable multiplied together
2. <u>D</u> Binomial	<input checked="" type="checkbox"/> b. The highest exponent in a polynomial expression
3. <u>G</u> Trinomial	<input checked="" type="checkbox"/> c. The number in front of a variable
4. <u>F</u> Constant	<input checked="" type="checkbox"/> d. A polynomial with two terms
5. <u>C</u> Coefficient	<input checked="" type="checkbox"/> e. A small number written to the top right which indicates how many times that number should be multiplied
6. <u>A</u> Term	<input checked="" type="checkbox"/> f. A single number with no variable attached to it (the y-intercept)
7. <u>E</u> Exponent	<input checked="" type="checkbox"/> g. A polynomial with three terms

3. Given the following polynomial:

a) What is the degree?

4

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

-7

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

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

QUARTIC
 ↗
 ↗
 ↗
 ↗

cubic quadratic Linear

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

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

FOIL
 1st, 2nd, 3rd, 4th

→ combine like terms!

include "zero" terms

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

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

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

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

↑ standard form!

highest exponent → lowest exponent

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

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

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

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

Practice: Perform the indicated operation. Simplify each expression.

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

$x^4 - y^4$

← * CONJUGATE!

- same binomial,
- opp. signs

• First + last terms only!

NOT like terms!

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

$x^3 + x^2 + x + 3$

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

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

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

4) $(x-4)^3$

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

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

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

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

$x^3 - 12x^2 + 48x - 64$

$$5) \overbrace{n(n+1)(n+2)}^{(n^2+n)(n+2)}$$

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

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

*PEMDAS!

$$6) \overbrace{x^3(x+6)+9}$$

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

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

$$x^8 - \cancel{x^7} + \cancel{x^{10}} - \cancel{x^5} + \cancel{x^4} - \cancel{x^3} + \cancel{x^2} - \cancel{x} + \cancel{x^7} - \cancel{x^6} + \cancel{x^5} - \cancel{x^4} + \cancel{x^3} - \cancel{x^2} + \cancel{x} - 1$$

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

Name: Key
UNIT 1

Date: _____
LESSON 1

EXIT TICKET

Perform the indicated operation. Simplify each expression.

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

$$\begin{array}{r}
 x^2 - 4x + 4 \\
 \times \quad \begin{array}{|c|c|c|} \hline x^3 & -4x^2 & +4x \\ \hline \end{array} \\
 +3 \quad \begin{array}{|c|c|c|} \hline +3x^2 & -12x & +12 \\ \hline \end{array} \\
 \hline
 \end{array}$$

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

EXTRA PRACTICE

1) $(3m^3 + m^2 - 2m - 5)(m^2 - 5m - 6)$

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

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

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

$9z^4 - 64$

CONJUGATE!

3) $(x+2)^3$

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

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

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

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

$x^3 + 6x^2 + 12x + 8$

