

## Warm-up:

- 1) What are your goals for this course?
- 2) What are your goals for the semester?
- 3) What are your overall goals in life?
4. Where does your struggles lie when it comes to math?

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## Unit 1 ~ Polynomials

Objective: A.APR.1

### Day 1:

## Adding, Subtracting, & Multiplying Polynomials

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### Example 1:

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

Like terms  
Same variable  
Same exponent

$$(3x^2 - 4x + 1) + (-2x - 4)$$
$$\boxed{3x^2 - 6x - 3}$$

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### Example 2:

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

	$4x^2$	$2x$	$1$
$2x^2$	$8x^4$	$4x^3$	$2x^2$
$3$	$12x^2$	$6x$	$3$

$$\boxed{8x^4 + 4x^3 + 14x^2 + 6x + 3}$$

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## Your Turn:

$$1) (-8x^3 + \underbrace{4x}_{-8x^3+4x^2+3x-1} - 1) + (4x^2 \underbrace{- x}_{-x})$$

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

	$x^3$	$2x$	$-1$
$x^2$	$x^5$	$2x^3$	$-1x^2$
$5$	$5x^3$	$10x$	$-5$

$$x^5 + 7x^3 - x^2 + 10 - 5$$

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## Example 3:

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

$$1) (x-a)^2 = (x-a)(x-a)$$

$x$	$x$	$-a$
$x$	$x^2$	$-ax$
$-a$	$-ax$	$a^2$

$$(x-a)^2 = x^2 - 2ax + a^2$$

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

$$(2x^2 + 3) + (4x^2 - 16x + 16)$$

$$6x^2 - 16x + 19$$

$$(x-a)^3 = (x-a)(x-a)(x-a)$$

$$(x-4)^2 = (x-4)(x-4)$$

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## Example 4:

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

$$(x+3)^3 = (x+3)(x+3)(x+3)$$

$x$	$x$	$3$
$x$	$x^2$	$3x$
$3$	$3x$	$9$

$$x^3 + 6x^2 + 9x$$

$$(x^3 + 9x^2 + 27x + 27) - 9x(x+3)$$

$$(x^3 + 9x^2 + 27x + 27) - (9x^2 + 27x)$$

$$= x^3 + 27$$

	$x^2$	$6x$	$9$
$x$	$x^3$	$6x^2$	$9x$
$3$	$3x^2$	$18x$	$27$

$$x^3 + 9x^2 + 27x + 27 = (x+3)^3$$

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## Example 4:

If the base of a triangle is given by the expression  $(3x^2 + 4x)$  and the height of the triangle is given by the expression  $(4x^2 + 4x + 6)$ , what is an expression for the area of the triangle, in terms of  $x$ ?

$$b = 3x^2 + 4x \quad h = 4x^2 + 4x + 6 \quad \text{find } A_{\Delta} = \frac{1}{2}(b \cdot h)$$

	$4x^2$	$4x$	$6$
$3x^2$	$12x^4$	$12x^3$	$18x^2$
$4x$	$16x^3$	$16x^2$	$24x$

$$\frac{1}{2}(12x^4 + 28x^3 + 34x^2 + 24x)$$

$$6x^4 + 14x^3 + 17x^2 + 12x$$

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## Your Turn:

The length of a rectangle can be represented by the expression  $(2x^2 - 3x + 5)$  and the width can be represented by the expression  $(3x + 5)$ . What expression represents the area of the rectangle?  $A_{\square} = l \cdot w$

Handwritten area model for the product of  $(2x^2 - 3x + 5)$  and  $(3x + 5)$ . The rectangle is divided into six smaller rectangles. The top row has three rectangles with widths  $3x$ ,  $3x$ , and  $3x$ , and heights  $2x^2$ ,  $-3x$ , and  $5$ . The bottom row has three rectangles with widths  $3x$ ,  $3x$ , and  $3x$ , and heights  $2x^2$ ,  $-3x$ , and  $5$ . The total area is  $6x^3 + 3x^2 + 25$ .

## Independent Practice 20 min.

## Exit Ticket

Simplify the following Expressions

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

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

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

