

## Skill Builder: Polynomials

### Terminology Review:

Like terms: same variable  
same exponent

- **Polynomial** – numerical coefficients are real numbers, exponents are non-negative integers

- Monomial – one term ex:  $x^2$  or 5
- Binomial – two terms ex:  $x^2 + 5$
- Trinomial – three terms ex:  $x^2 + 3x + 5$

- **Degree** of a polynomial is the value of the highest exponent

- Polynomial of degree 0 is called a constant ex: 5
- Polynomial of degree 1 is called a linear expression ex:  $y = 3x + 5$
- Polynomial of degree 2 is called a quadratic expression ex:  $y = x^2 + 3x + 5$
- Polynomial of degree 3 is called a cubic expression
- Polynomial of degree 4 is called a quartic expression

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### Adding and Subtracting Polynomials

- To **add or subtract** polynomials, combine like terms.
- Remember that if you are subtracting a polynomial, you must subtract **each term** of the polynomial.

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

$$\begin{aligned}
 &= \underline{-2x^2} + \underline{5x} - \underline{3} + \underline{x^2} - \underline{6x} + \underline{1} + \underline{3x^2} + \underline{2x} + \underline{4} \\
 &= \boxed{2x^2 + x + 2}
 \end{aligned}$$

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## Multiplying Polynomials

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

- To **multiply** (or **expand**) polynomials, use the **distributive property** – multiply each term inside the bracket by the number/term outside of the brackets.

- When a polynomial is multiplied by another polynomial, this means that **every term** in the first polynomial is multiplied by **every term** in the second polynomial.

$$(2x + 3y + 4z)^2 = (2x + 3y + 4z)(2x + 3y + 4z)$$

- After applying the distributive property don't forget to **collect like terms**!

Ex 2) **Expand**  $(2y-5)(3y^2+4y-6)$

$$= 6y^3 + 8y^2 - 12y - 15y^2 - 20y + 30$$

$$\boxed{6y^3 - 7y^2 - 32y + 30}$$

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Ex 3) **Expand**  $(2x^2-3x+1)(4x^2+5x-6)$

$$= 8x^4 + 10x^3 - 12x^2 - 12x^3 - 15x^2 + 18x + 4x^2 + 5x - 6$$

$$\boxed{8x^4 - 2x^3 - 23x^2 + 23x - 6}$$

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Ex 4) Expand  $(2x-5)^3$ 

$$[(2x-5)(2x-5)](2x-5)$$

$$(4x^2 - 20x + 25)(2x-5)$$

$$8x^3 - 40x^2 + 50x$$

$$-20x^2 + 100x - 125$$

$$8x^3 - 60x^2 + 150x - 125$$

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HW:

p. 88 #5-6ace

p. 95 #4-5ace, 10,11ac

Study for quiz tomorrow! (day 4/5/6/7)

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