

Warm-up: #1 write the polynomial in standard form, #2-4 factor and solve.

1.  $x = -5, x = 3i$

2.  $4x^2 + 21x - 18 = 0$

3.  $x^3 + x^2 - 3x - 3 = 0$

4.  $6x^3 - 25x^2 + 21x + 10 = 0$

**Divide (old school):**

1. 
$$\frac{42,894}{3}$$

2. 
$$\frac{22,345,623}{63}$$

How do we solve polynomial equations?

•  $(2x - 3)(2x + 1)(x - 5) = 0$

\*\*What about from the warm-up?

$$6x^3 - 25x^2 + 21x + 10 = 0$$

Two options: \_\_\_\_\_ OR \_\_\_\_\_

$$\frac{6x^3 - 25x^2 + 21x + 10}{x - 2}$$

**Option #1**

**Option #2**



Remainder Theorem:

**Examples:**

1.  $\frac{x^3-4x^2+2x-5}{x-3}$

2.  $\frac{2x^3-5x^2+8x-3}{2x-1}$

**What is different about these?:** \_\_\_\_\_

3.  $\frac{x^3+x-2}{x+2}$

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

$$5. \frac{x^2+8}{x+2}$$

$$6. \frac{18x^3+3x^2-61x+10}{3x-5}$$

Division (3 equivalent problems)

$$2x^3 + 7x^2 - 18x - 22 \div x + 4$$

$$2x^3 + 7x^2 - 18x - 22 * (x + 4)^{-1}$$

$$\frac{2x^3 + 7x^2 - 18x - 22}{x + 4}$$