

Warm-up:**Factor, then solve:**

1. $3x^2 - 14x + 8 = 0$

2. $25x^2 - 1 = 0$

Given the zeros, write a polynomial function of least degree that has real coefficients and a leading coefficient of 1.

3. $x = 3, x = -6$

4. $x = -1 + 7i$

Divide using long division or tabular division:

$$x + 4 \overline{) 3x^3 + 4x^2 - 30x + 8}$$

Why do we do polynomial division?

Synthetic Division – another method (quicker) for dividing, BUT it has its limitations

Limitations: _____

Ex: (from the warm-up):

$$x + 4 \overline{) 3x^3 + 4x^2 - 30x + 8}$$

Use synthetic, long, or tabular division to find the roots.

Examples:

1.
$$\frac{2x^3 - 10x^2 + 9x + 15}{x - 3}$$

2.
$$\frac{x^3 - 3x^2 - 7x + 6}{x + 2}$$

3.
$$\frac{2x^4 - x^3 - 4x^2 - 8}{x - 2}$$

4.
$$\frac{3x^3 - 81x + 30}{x - 5}$$

5.
$$\frac{6x^3 + 7x^2 + x + 1}{2x + 3}$$

6.
$$\frac{x^3 + 2x^2 - 4x + 1}{x^2 + x - 2}$$

When is it best to use:	
Long Division	Synthetic Division