Warm-Up

Solve by factoring: $x^3 - x^2 + x - 6 = 0$

$x^2(x-1) + 1(x-6) = 0$

Unit 2

Learning Target 4

I can solve polynomials using synthetic division

Write the following in factored form then list the zeros.

1.) given a zero. $x^3 + 4x^2 - 3x - 12; \quad -4$

$x = -4$

-4	1	4	-3	-12
		-4	0	12
	1	0	-3	0

$1x^2 + 0x - 3 = 0$

$x^2 - 3 = 0$

$\sqrt{x^2} = \sqrt{3}$

$x = \pm\sqrt{3}$

Factored Form: $f(x) = (x+4)(x^2-3)$

Zeros: $x = -4, \sqrt{3}, -\sqrt{3}$

2.) Given a factor. $f(x) = 4x^4 - 37x^2 + 9; \quad x - 3$

3	4	0	-37	0	9
		12	36	-3	-9
	4	12	-1	-3	0

$(4x^3 + 12x^2 - 1x - 3) = 0$

$4x^2(x+3) - 1(x+3) = 0$

$(4x^2 - 1)(x+3) = 0$

$4x^2 - 1 = 0$

$4x^2 = 1$

$x^2 = \frac{1}{4}$

$x = \pm\sqrt{\frac{1}{4}} = \pm\frac{1}{2}$

$x + 3 = 0$

$x = -3$

Factored Form: $f(x) = (x-3)(4x^2-1)(x+3)$

Zeros: $x = 3, 1/2, -1/2, -3$

3.) Given a function. $f(x) = 6x^3 + x^2 - 10x + 3$

1 | 6 1 -10 3
↓ 6 7 -3
6 7 -3 0

$2x+3=0$ $3x-1=0$
$2x=-3$ $3x=1$
$x=-3/2$ $x=1/3$

$6x^2+7x-3=0$

-18
9×-2
7

$(2x+3)(3x-1)=0$

Factored Form: $f(x)=(x-1)(2x+3)(3x-1)$

Zeros: $x=1, -3/2, 1/3$

Let's look back at the warm-up

Solve by factoring: $x^3 - x^2 + x - 6 = 0$

2 | 1 -1 1 -6
↓ 2 2 6
1 1 3 0

$x^2 + x + 3 = 0$

3
$\times$
1

Now what? Stay tuned tomorrow to see what happens next!