

6.2 Solving Polynomial Equations

- Group Review Activity –

Directions: In your groups of 3 – 4 people, go through this packet working on one round at a time. *Make sure everyone in your group understands the problems as you go!* Use academic vocabulary throughout the activity and take time to have collaborative discussions.

Round # 1:

- *Regular Quadratics* -

Directions: Solve for all zeros. Use factoring and/or quadratic formula.

1.) $x^2 + 7x = 30$

2.) $18x^2 + 12x = 0$

3.) $4x^2 - 25 = 0$

4.) $x^2 - 5 = -3x$

Round # 2:

- Sum/Difference of Cubes -

**Directions: Factor, then solve for all
zeros.**

1.) $x^4 - 125x = 0$

2.) $27x^3 + 8 = 0$

Round # 3:

- *“Quadratic-Like” Polynomials* -

Directions: Solve for all zeros.

1.) $x^4 - 2x^2 = 63$

2.) $5x^7 + 50x^5 + 80x^3 = 0$

Round # 4:

- Synthetic Division -

1.) Divide using synthetic division:

$$(x^3 + 6x - 17) \div (x - 2)$$

2.) Is the given binomial a factor of the given polynomial? (Yes or No)

$$\begin{array}{r} 4x^4 - 22x^3 + 3x^2 + 38x - 6 \\ \hline x - 5 \end{array}$$

3.) Divide using the given factor, then fully factor the polynomial.

$$\begin{array}{r} x^3 - 4x^2 - 11x + 30 \\ \hline x + 3 \end{array}$$

Round # 5:

- *Writing Polynomial Equations* -

Directions: Given the zeros, write a polynomial equation in standard form.

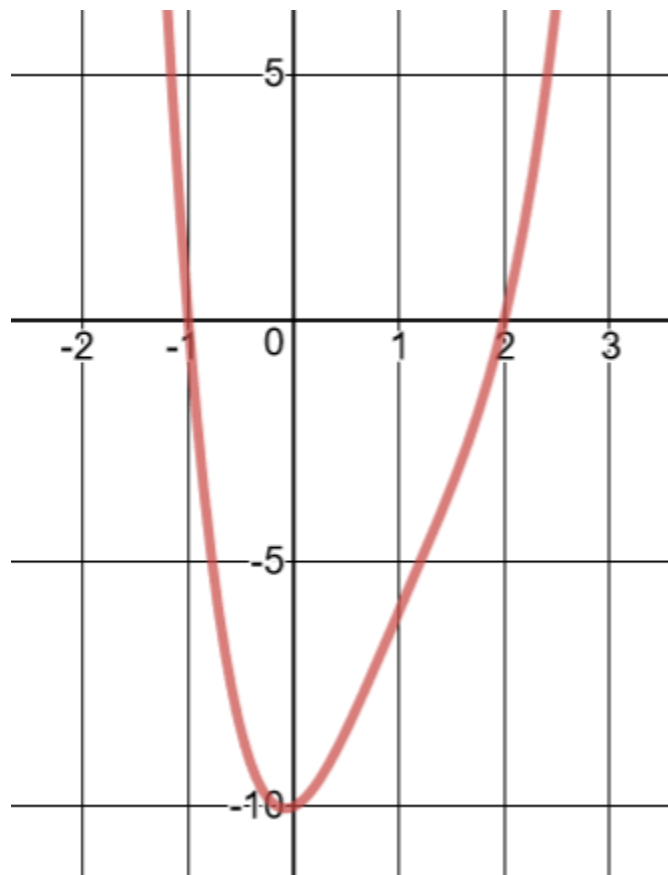
1.) 0 (*mult. 2*), 3 and $-\frac{1}{2}$

2.) $3i$ and $-\sqrt{5}$

Round # 6:

- Solve using Synthetic Division #1 -

Directions: Find all zeros, given this graph of the polynomial.



1.) $x^4 - 4x^3 + 6x^2 + x - 10 = 0$

Round # 7:

- Solve using Synthetic Division #2 -

Directions: Find all zeros, given this graph of the polynomial.



1.) $x^5 + x^3 + 2x^2 - 12x + 8 = 0$

Challenge Problem! #1

Directions: Factor, then find all zeros.

$$x^4 - 27x - 54 = -2x^3$$

Challenge Problem! #2

Directions: Factor, then find all zeros.

$$x^6 + 19x^3 - 216 = 0$$

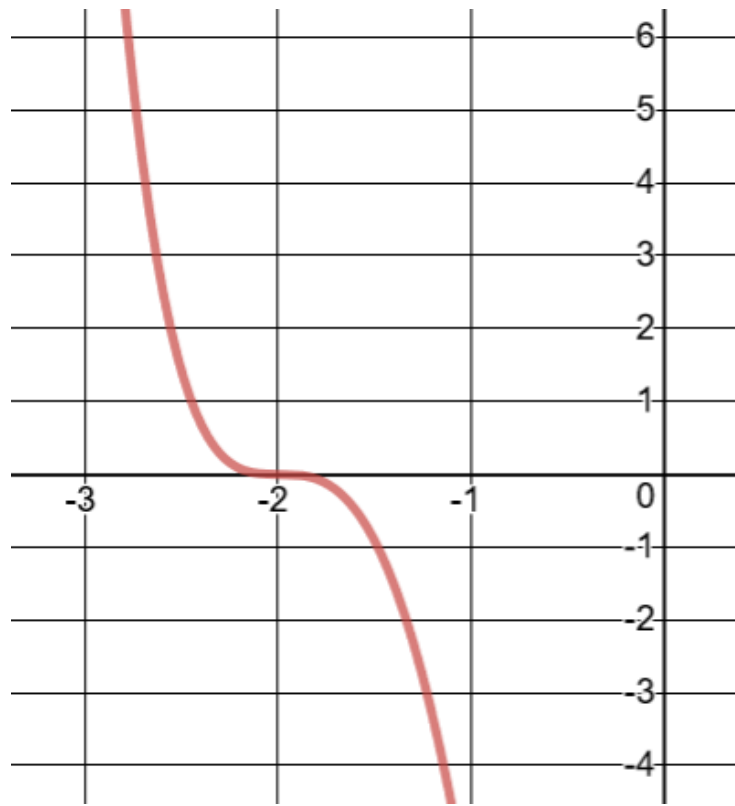
Challenge Problem! #3

Directions: Given the zeros, write a polynomial equation in standard form.

$$(3 - 5i), i\sqrt{2} \text{ and } -3i$$

Challenge Problem! #4

Directions: Find all zeros, given this graph of the polynomial.



$$x^5 + 6x^4 + 17x^3 + 38x^2 + 60x + 40 = 0$$