Building Polynomials from Known Attributes

By the end of this lesson, I will be able to answer the following questions…

1. How do I build polynomials from ***zeros***?

2. What is a ***conjugate***?

3. What are the properties of a conjugate and how do I use them to build polynomials?

4. What is the ***irrational conjugate rule*** and ***complex conjugate rule***

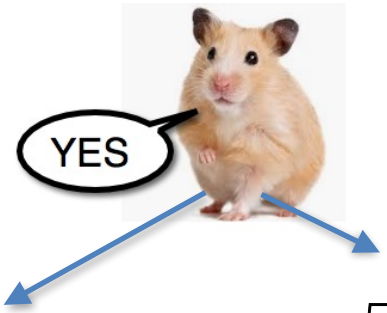
Vocabulary

Conjugates

$(x-5)(x+5)$ $(x-\sqrt{5})(x+\sqrt{5})$ $(x-5i)(x+5i)$

What is a pattern you notice?

Prerequisite Skills with Practice



$\sqrt{a} \cdot \sqrt{b} = \sqrt{a \cdot b}$

$\sqrt{2} \cdot \sqrt{5} =$

$\sqrt{2} \cdot \sqrt{10} =$

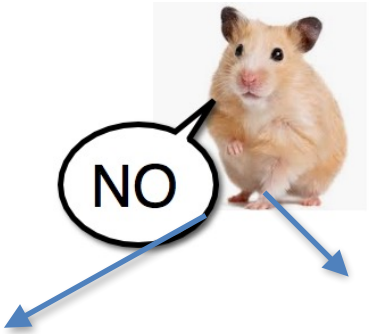
$\sqrt{2} \cdot \sqrt{2} =$

$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

$\sqrt{\frac{4}{9}} =$

$\sqrt{\frac{5}{9}} =$

$\sqrt{\frac{4}{5}} =$



$\sqrt{a} + \sqrt{b} \neq \sqrt{a+b}$ $\quad \sqrt{a} - \sqrt{b} \neq \sqrt{a-b}$

Are $\sqrt{9+16}$ and $\sqrt{9}+\sqrt{16}$ equal?

Find a possible polynomial with all integer coefficients and the zeros of -3, 2 and 0.
Sketch the graph afterwards. afterwards. Confirm using Confirm using a graphing calculator.

The ***fully factored form*** of f(x) is:

The ***zeros*** are:

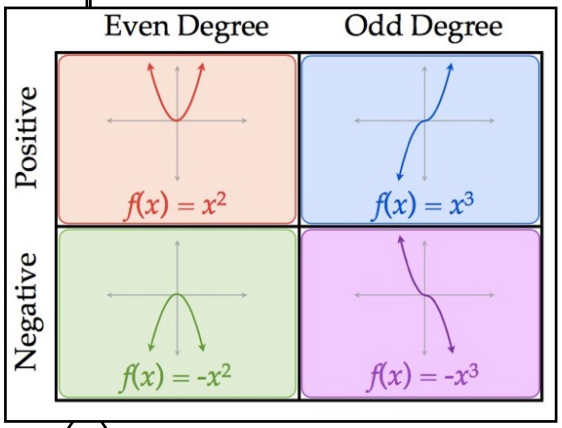
The ***x-intercepts*** are:

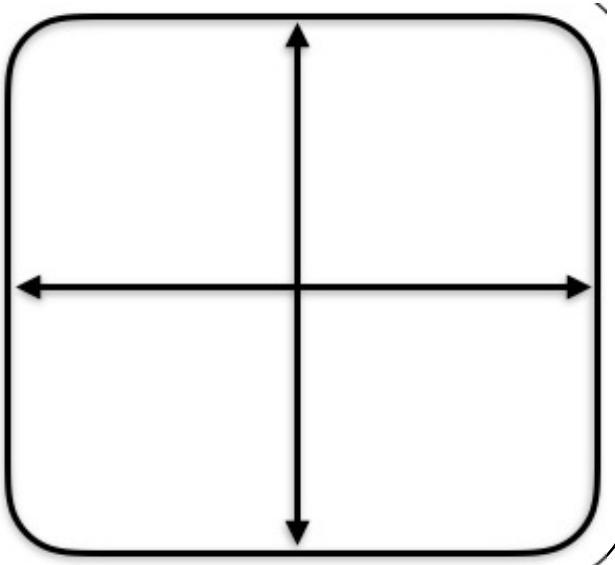
The ***y-intercept*** of the polynomial is:

The ***end behavior*** of the polynomial is…

if $x \to \infty$ then $y \to$ _____

if $x \to -\infty$ then $y \to$ _____





Find a possible polynomial with all integer coefficients and the zeros of 3; mult 2 and 0; mult 3
Sketch the graph afterwards. afterwards. Confirm using Confirm using a graphing calculator.

The ***fully factored form*** of f(x) is:

The ***zeros*** are:

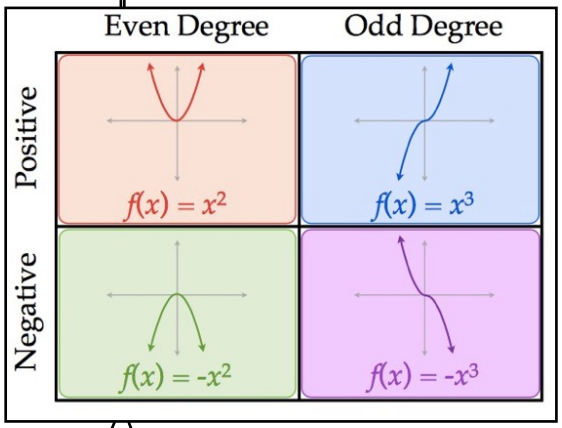
The ***x-intercepts*** are:

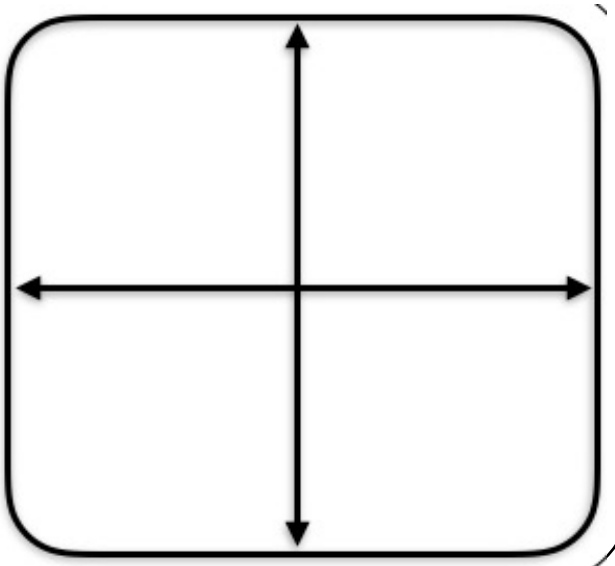
The ***y-intercept*** of the polynomial is:

The ***end behavior*** of the polynomial is…

if $x \to \infty$ then $y \to$ _____

if $x \to -\infty$ then $y \to$ _____





Find a possible polynomial with all integer coefficients with the zeros of $\sqrt{7}$ and 1. is a zero also. (and vice versa) Sketch the graph afterwards. afterwards. Confirm using a graphing calculator.

Irrational Conjugate Rule:
If $\sqrt{b}$ is a zero of a polynomial $-\sqrt{b}$ with all integer coefficients, then

The ***fully factored form*** of f(x) is:

The ***zeros*** are:

The ***x-intercepts*** are:

The ***y-intercept*** of the polynomial is:

The ***end behavior*** of the polynomial is…

if $x \to \infty$ then $y \to$ _____

if $x \to -\infty$ then $y \to$ _____

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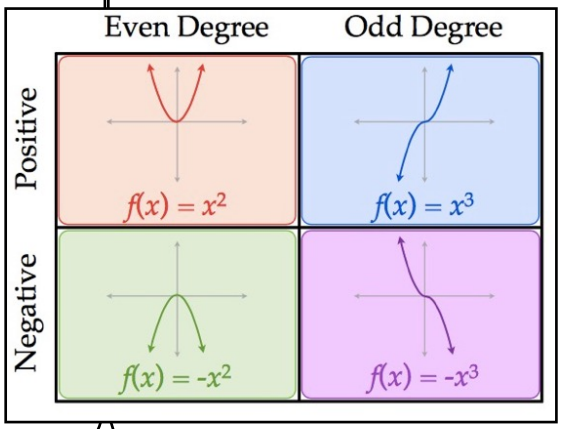
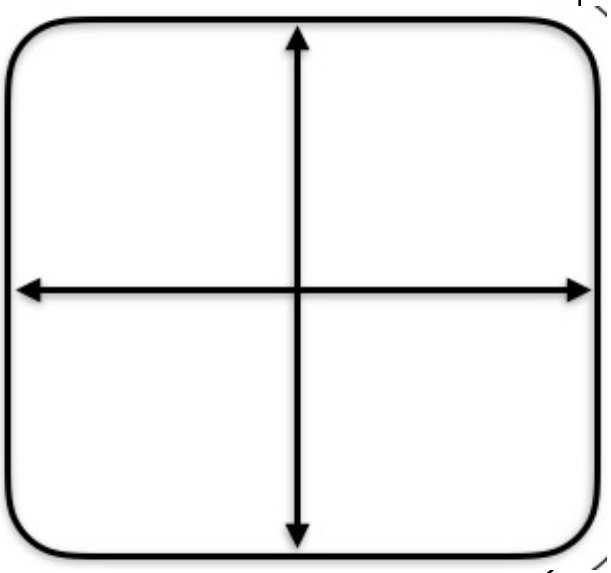




Find a possible polynomial with all integer coefficients with the zeros of $2-\sqrt{15}$ and 0. Sketch the graph afterwards. Confirm using a graphing calculator.

Irrational Conjugate Rule:
If $a+\sqrt{b}$ is a zero of a polynomial with all integer coefficients, then $a-\sqrt{b}$ is a zero also. (and vice versa)

The ***fully factored form*** of f(x) is:

The ***zeros*** are:

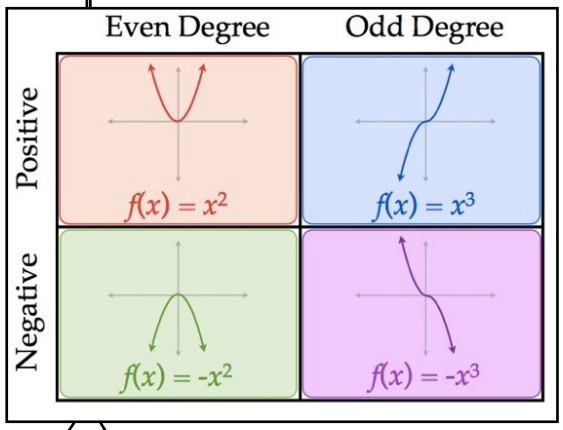
The ***x-intercepts*** are:

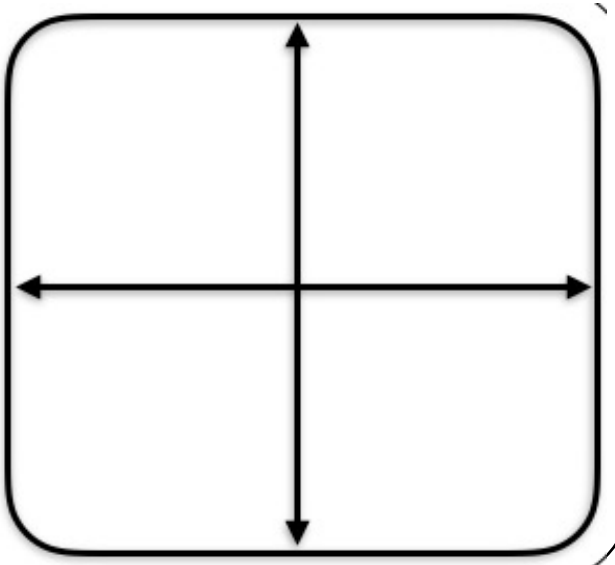
The ***y-intercept*** of the polynomial is:

The ***end behavior*** of the polynomial is…

if $x \to \infty$ then $y \to$ _____

if $x \to -\infty$ then $y \to$ _____





Find a possible polynomial
with all integer coefficients
with the zeros of $-3i$ and -4.

Complex Conjugate Rule:
If bi is a zero of a polynomial with all integer coefficients, then $-bi$ is a zero also. (and vice versa)

The ***fully factored form*** of f(x) is:

The ***zeros*** are:

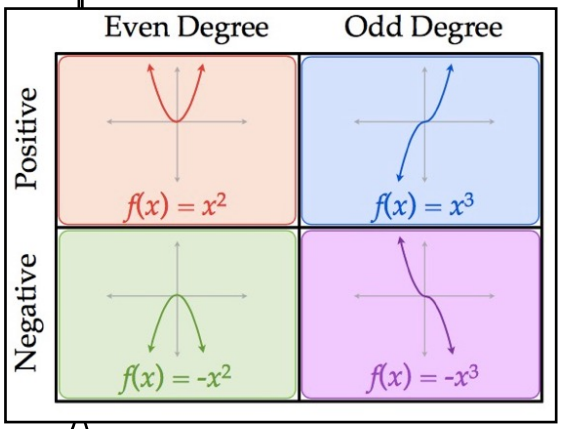
The ***x-intercepts*** are:

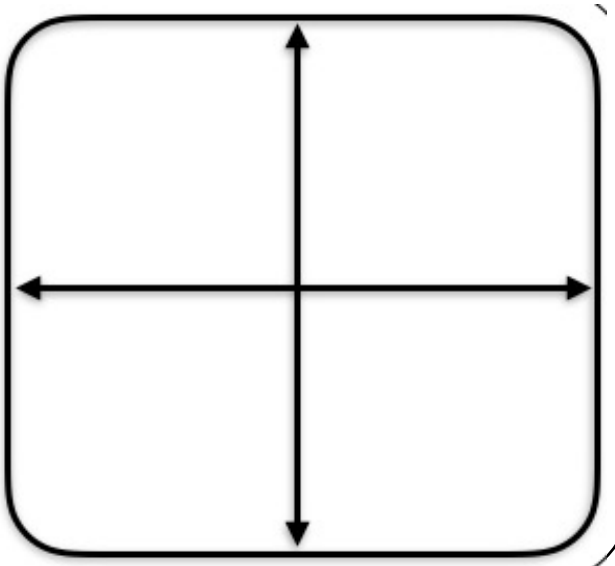
The ***y-intercept*** of the polynomial is:

The ***end behavior*** of the polynomial is…

if $x \to \infty$ then $y \to$ _____

if $x \to -\infty$ then $y \to$ _____





THE END

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