

What's Going On?

Checking In

Minds on

Lines and Parabolas

Action!

Desmos Investigation

Consolidation

Fill in the Blanks

Learning Goal - I will be able to describe the features of polynomial graphs from their equations.

Minds on

Lines and Parabolas

Describe how the graphs of each set of equations would differ:

$$\overset{\text{rises}}{\underbrace{y = ax + b}} \text{ and } \overset{\text{falls}}{\underbrace{y = -ax + b}}$$

$$\underbrace{y = ax^2 + bx + c}_{\text{U}} \text{ and } \underbrace{y = -ax^2 + bx + c}_{\text{∩}}$$

Minds on

Lines and Parabolas

How many zeroes can a linear function have?

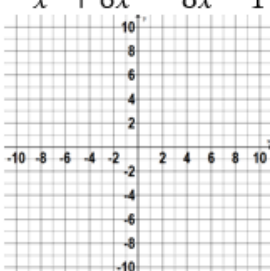
1

How many zeroes can a quadratic function have?

2

Action!

Desmos Investigation

Equation and Graph	Degree	Even or Odd Degree	Leading Coefficient	End Behaviours		Number of Turning Points
				$x \rightarrow -\infty$	$x \rightarrow +\infty$	
$-x^5 + 6x^3 - 8x - 1$ 	5	odd	-1	$y \rightarrow +\infty$	$y \rightarrow -\infty$	4

Action!

Follow Up

Can you predict the "end behaviours" of the graph of a polynomial function given its equation?

Leading coefficient \oplus as $x \rightarrow +\infty$, $y \rightarrow +\infty$
as $x \rightarrow -\infty$ even: $y \rightarrow +\infty$
odd: $y \rightarrow -\infty$

Leading coefficient \ominus as $x \rightarrow +\infty$, $y \rightarrow -\infty$
as $x \rightarrow -\infty$ even: $y \rightarrow -\infty$
odd: $y \rightarrow +\infty$

Action!

Follow Up

Can you predict the number of turning points in the graph of a polynomial function given its equation?

n turning points: degree $n+1$ or greater

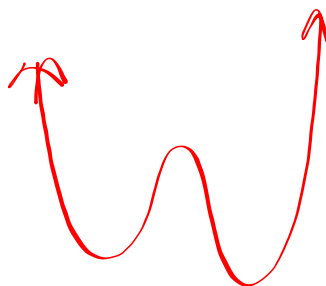
odd: even # turning points
even: odd # turning points

Action!

Follow Up

How many turning points would a function with degree 4 have?

3 or 1

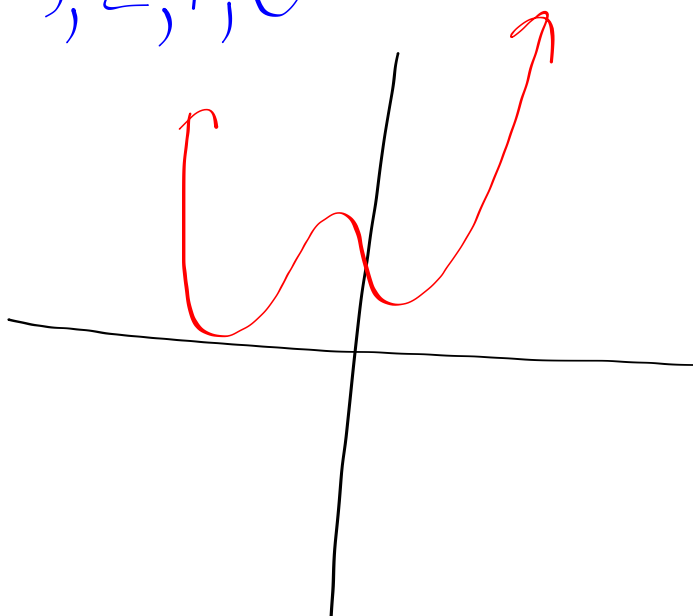


Action!

Follow Up

How many zeroes would a function with degree 4 have?

✓ ✓ ✓ ✓
4, 3, 2, 1, 0

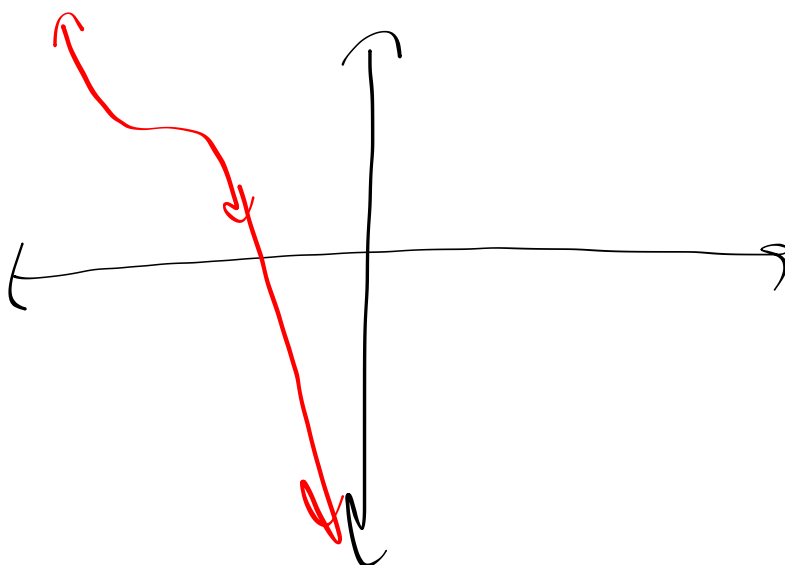


Action!

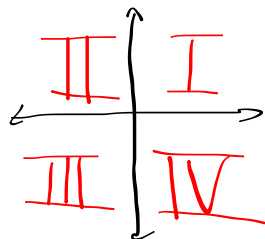
Follow Up

How many zeroes would a function with degree 5 have?

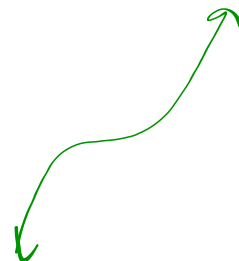
✓ ✓ ✓ ✓ ✓
5, 4, 3, 2, 1, 0



Consolidation



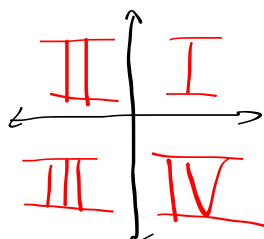
Fill in the Blanks



An odd degree polynomial with a leading coefficient that is **positive** will always extend from quadrant 3 to quadrant 1.

An odd degree polynomial with a leading coefficient that is **negative** will always extend from quadrant 2 to quadrant 4.

Consolidation



Fill in the Blanks

An even degree polynomial with a leading coefficient that is **positive** will always extend from quadrant 2 to quadrant 1.

An even degree polynomial with a leading coefficient that is **negative** will always extend from quadrant 3 to quadrant 4.

Consolidation

Fill in the Blanks

An odd degree polynomial will always have a(n)

even number of turning points.

An even degree polynomial will always have

a(n) odd number of turning points.

A polynomial function of degree n has, at most,

$n-1$ turning points.

Consolidation

Fill in the Blanks

A polynomial of degree n can have up to n zeroes.

An odd degree polynomial has a minimum of 1 zeroes, and an even degree polynomial has a minimum of 0 zeroes.

Consolidation

Sketch It!

Sketch:

1. An odd degree polynomial with a positive leading coefficient and 3 zeroes.
2. An even degree polynomial with a negative leading coefficient and 4 zeroes.
3. An odd degree polynomial with a negative leading coefficient and 4 zeroes.
4. An even degree polynomial with a positive leading coefficient and 3 zeroes.

Pg. 136

3, 4, 5, 13