

Polynomial Functions and Graphs

ZEROS CONTINUED...

Find the zeros of each function:

5. $y = (x-1)(x+2)$

Factored Form

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

$x=1$ $x=-2$

$x = -2, 1$

6. $f(x) = x^3 - 36x$

$f(x) = x(x^2 - 36)$

$f(x) = x(x-6)(x+6)$

$x=0$ $x-6=0$ $x+6=0$
 $x=6$ $x=-6$

$x = -6, 0, 6$

7. $y = x(x+4)(x-2)$
Factored Form

$x=0$ $x+4=0$ $x-2=0$

$x=-4$ $x=2$

$x = -4, 0, 2$

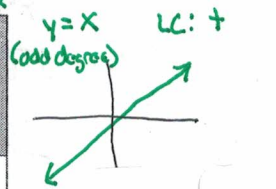
x-int: $(-4, 0)$ $(0, 0)$ $(2, 0)$

DEGREE & LEADING COEFFICIENT:

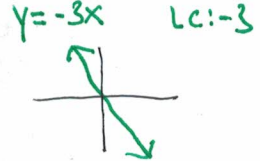
- The **DEGREE** of a polynomial tells the maximum number of turning points the graph will have. # of turns = degree - 1

- The **END BEHAVIOR** comes from describing the y-values of the graph as you go further to the left or the right of the graph. *What are the ARROWS DOING IN THE GRAPH?*

End Behavior Table	Degree Even	Degree Odd
Leading Coefficient Positive +	Arrows are going Up and Up. $f(x)$ or y is going to ∞	Arrows are Down and Up. $f(x)$ or y will be $-\infty, \infty$
Leading Coefficient Negative -	Arrows are going down and down. $f(x)$ or y is going to $-\infty$	Arrows are Up and Down. $f(x)$ or y will be $\infty, -\infty$
	* Arrows go the SAME direction! *	* Arrows go in OPPOSITE direction *



As $x \rightarrow -\infty, f(x) \rightarrow -\infty$
As $x \rightarrow \infty, f(x) \rightarrow \infty$



As $x \rightarrow -\infty, f(x) \rightarrow \infty$
As $x \rightarrow \infty, f(x) \rightarrow -\infty$

Describe the end behavior of each of the following:

1. $y = 4x^3 - 3x$
odd degree
negative LC

As $x \rightarrow -\infty, f(x) \rightarrow \infty$
As $x \rightarrow \infty, f(x) \rightarrow -\infty$

2. $f(x) = x^3 + 7x^2 + 10x$

As $f(x) \rightarrow -\infty, x \rightarrow -\infty$
As $f(x) \rightarrow \infty, x \rightarrow \infty$

3. $y = (2x+3)(x-1)$
 $y = 2x^2 - 2x + 3x - 3$
 $y = 2x^2 + x - 3$
even degree
positive LC

As $f(x) \rightarrow \infty, x \rightarrow -\infty$
As $f(x) \rightarrow \infty, x \rightarrow \infty$

