

End Behavior

What happens at the far left and right of a graph is called **end behavior**.

Investigate the connection between the degree of the polynomial, the sign of its leading coefficient and its end behavior by graphing the functions on your calculator and completing this table.

Polynomial function	$p(x) = -x^4 + 3x^3$		$p(x) = x^4 - 2x^3$		$p(x) = x^3 - 2x^2$		$p(x) = -2x^3 + 6x^2$	
Graph								
Degree	even	odd	even	odd	even	odd	even	odd
Leading Coefficient	positive	negative	positive	negative	positive	negative	positive	negative
End Behavior	Left end	Right end	Left end	Right end	Left end	Right end	Left end	Right end
	rises	rises	rises	rises	rises	rises	rises	rises
	falls	falls	falls	falls	falls	falls	falls	falls

Come up with some rules for determining end behavior from the degree and leading coefficient:

Examples:

End behavior	Degree	Lead coefficient	Left	right
$f(x) = x^2(3x - 5)^2$				
$f(x) = -3x^5 + 4x^2 - 12$				
$g(x) = 3x^2 - 2x^3 + 4x$				
$h(x) = -3(x + 2)^2(x - 3)^2$				

Possible Degree

Use end behavior and ~~turning~~ ^{critical} points to find the possible degrees of the following polynomials.

Graph				
possible degrees				