

Lesson Vocabulary

Polynomial - Any function written in standard form (descending exponent order).

Degree of a polynomial - The largest exponent of the polynomial





Degree	Name	max/min	# of Points
2	Quadratic	1	3
3	Cubic	2	4
4	Quartic	3	5
5	Quintic	4	6

Max, min, Zeros - Same as above

Y-intercept - Where the graph crosses the y-axis.

To find, plug zero in for x and solve for y.

End Behavior - The behavior of the function as it approaches $-\infty$ and $+\infty$. (left ^{y-values} and right)

	degree	leading coefficient	$x \rightarrow -\infty, x \rightarrow +\infty$ left, Right	example
Same	even	+	$+\infty, +\infty$	
	even	-	$-\infty, -\infty$	
diff.	odd	+	$-\infty, +\infty$	
	odd	-	$+\infty, -\infty$	

Example Problem(s)

ex.) what is the degree and type of the polynomial function.

a) $x^4 - 3x^5 + 4x^3$

$-3x^5 + x^4 + 4x^3$

degree = 5

Quintic

b)



degree = 3

Cubic

ex.) find the max/min, zeros and y-int.

$f(x) = x^4 + 3x^3 - x^2 - 3x + 4$

max: $y = 4.94$

min: $y = -2.91, y = 2.62$

Zeros: $x = -2.79, x = -1.67$

Y-int: $f(x) = 0^4 + 3(0)^3 - 0^2 - 3(0) + 4$
 $(0, 4)$

ex.) Describe the end behavior

a) $-x^4 + 3x^2 + 1$

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

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

$(-\infty, -\infty)$

b) $x^5 + 3x^2 + 1$

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

$x \rightarrow +\infty, f(x) \rightarrow +\infty$

ex.) Describe the degree and coeff. of the function according to the end behavior.



degree: even

coeff.: neg.



degree: odd

coeff.: neg.

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a i) $f(x)$ - degree of 3, cubic
 $g(x)$ - degree of 4, Quartic

a ii) $f(x)$: max $(-2, 46, 9.26)$, min $(-0.2, -2.3)$

$g(x)$: max $(2, 20)$, min $(0, 4)(4, 4)$

b) Quartic, need 5 points
 $(0, 0)(2, 4)(3, 0)(4, 4)(6, 0)$

$$f(x) = -0.5x^4 + 6x^3 - 22.5x^2 + 27x$$

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a) Any function written in standard form

b) The largest exponent of the polynomial

c) max - the highest point of the graph

min - the lowest point of the graph

The # of max/min is always one less than the degree.

d) one more point than the degree of the function.

Extra! By looking at a graph, how do you know what kind of function it is?

By the # of max/min. The degree is one more than the # of max/min.