

Classifying Polynomials: All polynomials are classified by degree and number of terms.

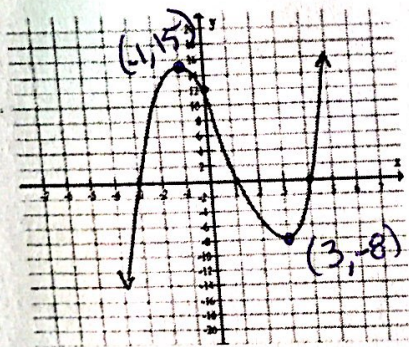
DEGREE	
0	Constant
1	Linear
2	Quadratic
3	Cubic
4	Quartic

NUMBER OF TERMS	
1	Monomial
2	Binomial
3	Trinomial
4 or more	Polynomial

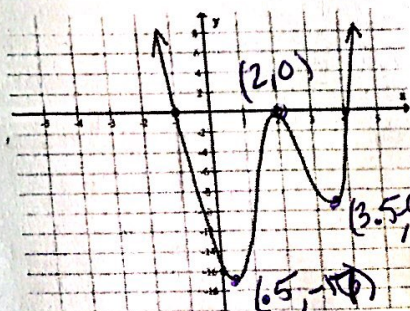
1. Fill in the missing information.

Polynomial Function	Name (degree)	Name (terms)	End Behavior
$f(x) = 3x^2 - 5$	Quadratic	Binomial	$x \rightarrow -\infty, y \rightarrow \infty$ $x \rightarrow \infty, y \rightarrow \infty$
$y = -x^4 + 6x - 1$	Quartic	Trinomial	$y \rightarrow -\infty$
$g(x) = 6x$	Linear	monomial	$x \rightarrow -\infty, y \rightarrow -\infty$ $x \rightarrow \infty, y \rightarrow \infty$
$h(x) = 5x^2 - 2x^3 + 7x - 3$	Cubic	Polynomial	$x \rightarrow \infty, y \rightarrow -\infty$ $x \rightarrow -\infty, y \rightarrow \infty$

2. Identify the zeros of each function below. Be sure to state any multiplicity.



Zeros: $-3, 1, 4$
 Range: $(-\infty, \infty)$
 Write the factors: $(x+3)(x-1)(x-4)$ Domain: $(-\infty, \infty)$
 Coordinates of extremas:
 on graph
 Increasing intervals: $(-\infty, -1) \cup (3, \infty)$
 Decreasing intervals: $(-1, 3)$
 y-intercept: $(0, 12)$
 Type of Function: Cubic



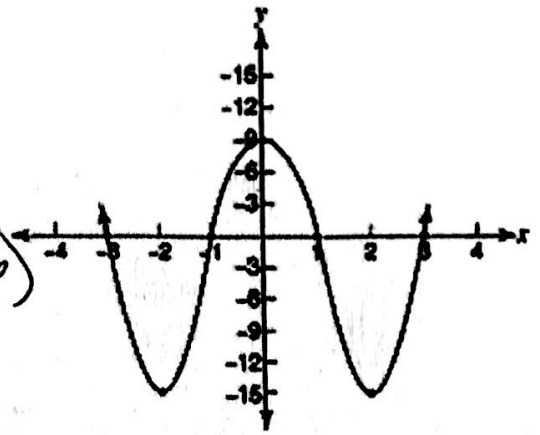
Zeros: $-1, 2, 4$
 Range: $(-17, \infty)$
 Write the factors: $(x+1)(x-2)^2(x-4)$ Domain: $(-\infty, \infty)$
 Coordinates of extremas:
 on graph
 Increasing intervals: $(-1, 2) \cup (3.5, \infty)$
 Decreasing intervals: $(-\infty, 1.5) \cup (2, 3.5)$
 y-intercept: $(0, -16)$
 Type of Function: Quartic

3. Given the graph, state the intervals where the graph is increasing/decreasing and state the domain and range.

$(-\infty, -2) \cup (0, 2) \uparrow (-2, 0) \cup (2, \infty)$

4. Given the graph, write the factors.

$(x+3)(x+1)(x-1)(x-3)$



Write an equation to represent each function described below:

5. A cubic function with x-intercepts at 1 and -2 (multiplicity of 2)

$y = (x-1)(x+2)^2$

6. A parabola that has a minimum at (2, 4) with a width controlled by a factor of 6

$y = 6(x-2) + 4$

7. A quartic function with x-intercepts at -3, -1/2, 3/4 (multiplicity of 2)

$y = (x+3)(2x+1)(4x-3)^2$

8. A cubic function with x-intercepts at 0 and -2 (multiplicity of 2)

$y = x(x+2)^2$

Given the following equations, state the transformations

9. $y = -4(x-3)^2 + 7$

Transformations: Reflected, stretched by 4
right 3 up 7

Vertex: (3, 7)

Axis of symmetry: $x = 3$

Domain: $(-\infty, \infty)$

Range: $(-\infty, 7]$

Maximum or Minimum?

10. $\frac{1}{2}(x+4)^2 - 2$

Transformations: compressed by 1/2
left 4 down 2

Vertex: (-4, -2)

Axis of symmetry: $x = -4$

Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$

Maximum or Minimum?