Bell Work

Common Polynomial Functions			
Degree	**Type**	**Standard Form**	**Example**
0	Constant	$f(x) = a_0$	$f(x) = -14$
1	Linear	$f(x) = a_1x + a_0$	$f(x) = 5x - 7$
2	Quadratic	$f(x) = a_2x^2 + a_1x + a_0$	$f(x) = 2x^2 + x - 9$
3	Cubic	$f(x) = a_3x^3 + a_2x^2 + a_1x + a_0$	$f(x) = x^3 - x^2 + 3x$
4	Quartic	$f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x + a_0$	$f(x) = x^4 + 2x - 1$

Identifying Polynomial Functions

Determine whether each function is a polynomial function. If so, write it in standard form and state its degree, type, and leading coefficient.

a. $f(x) = -2x^3 + 5x + 8$

b. $g(x) = -0.8x^3 + \sqrt{2}\,x^4 - 12$

Determine whether each function is a polynomial function. If so, write it in standard form and state its degree, type, and leading coefficient.

c. $h(x) = -x^2 + 7x^{-1} + 4x$

d. $k(x) = x^2 + 3^x$

Evaluating a Polynomial Function

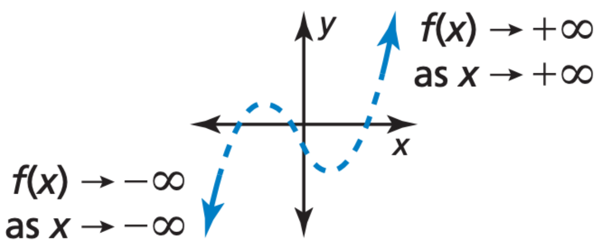
Evaluate $f(x) = 2x^4 - 8x^2 + 5x - 7$ when $x = 3$.

The end behavior of a function is the behavior of the graph as x approaches positive infinity ($+\infty$) or negative infinity ($-\infty$). For a polynomial function, the end behavior is determined by the function’s degree and the sign of its leading coefficient.

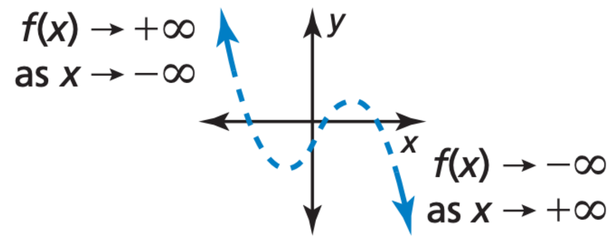
KEY IDEA

End Behavior of Polynomial Functions

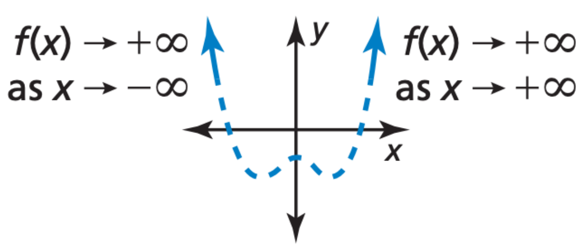
Degree: odd
Leading coefficient: positive



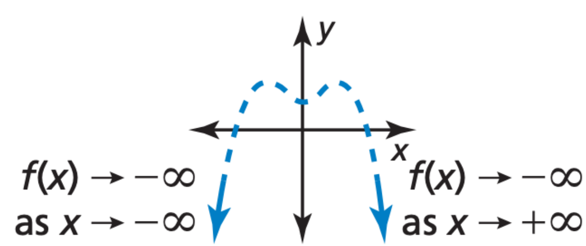
Degree: odd
Leading coefficient: negative



Degree: even
Leading coefficient: positive



Degree: even
Leading coefficient: negative



Describe the end behavior of

$$f(x) = -0.5x^4 + 2.5x^2 + x - 1.$$

Describe the end behavior of

$f(x) = 0.25x^3 - x^2 - 1.$

Graphing Polynomial Functions

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

Graph the function.

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