3.2B Properties of a Function's Graph (Algebraically)

▼ Intercepts\Real Zeros

▼ Definition of an **x-intercept**

An **x-intercept** is the ordered pair where the graph crosses or touches the x-axis.

▼ Definition of a **y-intercept**

A **y-intercept** is the ordered pair where the graph crosses or touches the y-axis.

▼ Definition of a **real zero**

A real number $x = c$ is a real zero of a function f if $f(c) = 0$. Real zeros are also *x*-intercepts.

▼ Examples: Find the intercepts\real zeros

▼ Example 1

$f(x) = -3x + 6$

▼ Example 2

$g(x) = x^2 - x - 12$

▼ Example 3

$h(x) = 6x^2 + 13x - 28$

▼ Example 4

$s(x) = 4x^2 + 5x + 2$

▼ Example 5

$q(x) = |x + 4| - 5$

▼ Example 6

$f(x) = |x - 7| + 3$

▼ Example 7

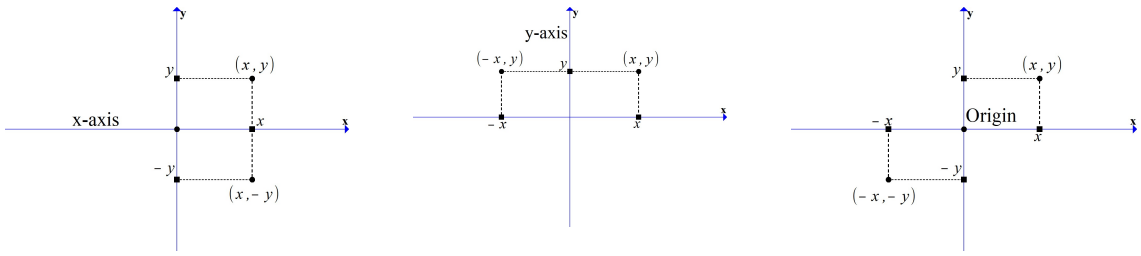
$f(x) = \sqrt{x + 4} - 3$

▼ Example 8

$f(x) = 2x^{3/2} - 16$

▼ Even, Odd, or Neither

▼ Symmetry



▼ Definition of an Even Function

A function f is **even** if for every x in the domain, $f(x) = f(-x)$. The graph of an even function is symmetric about the y-axis. For each point (x, y) on the graph, the point $(-x, y)$ is also on the graph.

▼ Definition of an Odd Function

A function f is **odd** if for every x in the domain, $-f(x) = f(-x)$. The graph of an odd function is symmetric about the origin. For each point (x, y) on the graph, the point $(-x, y)$ is also on the graph.

▼ Determining if a Function is Even or Odd Algebraically

Calculate $f(-x)$

If $f(-x)$ is the same as $f(x)$, the function is even.

If $f(-x)$ is the opposite of $f(x)$, the function is odd.

If $f(-x)$ doesn't fit the above definitions state the function is neither even or odd.

▼ Examples: Determine if the function is even odd or neither.

▼ Example 1

$f(x) = x^2 - 9$

▼ Example 2

$g(x) = x^3 - x$

▼ Example 3

$h(x) = x^3 - 1$

▼ Example 4

$f(x) = |x| + 7$

▼ Example 5

$f(x) = \frac{2}{x}$