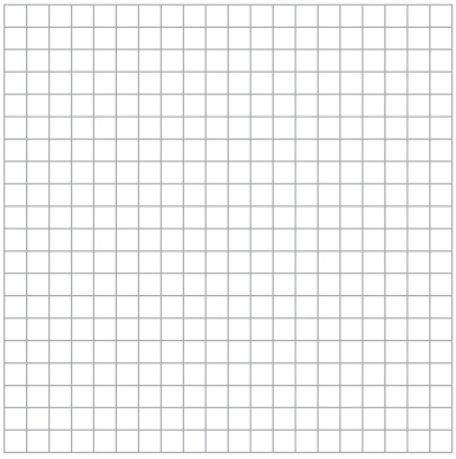
Name : _____

MATH MONKS

Characteristics of Quadratic Functions

Find the following characteristics of each graph.

① $f(x) = 2x^2 + 4x + 1$



Vertex:

Axis of Symmetry:

End behavior:

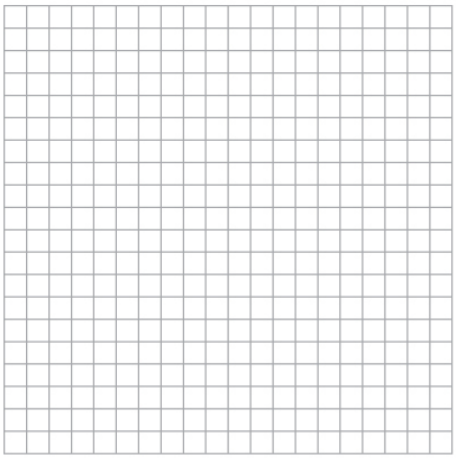
x-intercepts:

y-intercepts:

Domain:

Range:

② $f(x) = x^2 + 12x - 9$



Vertex:

Axis of Symmetry:

End behavior:

x-intercepts:

y-intercepts:

Domain:

Range:

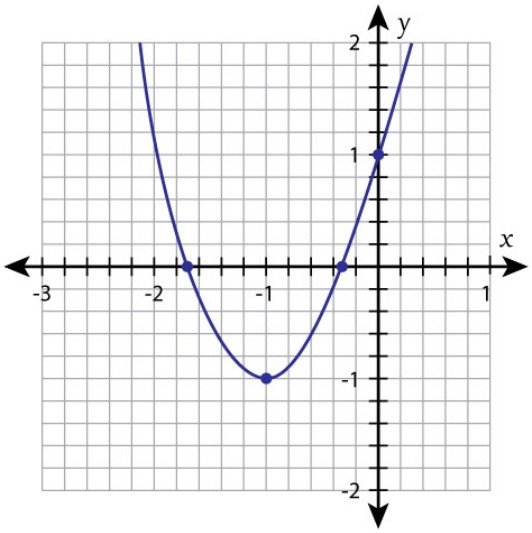
Name : _____

MATH MONKS

Characteristics of Quadratic Functions

Answers

① $f(x) = 2x^2 + 4x + 1$



Vertex: (-1, -1)

Axis of Symmetry: $x = -1$

End behavior:

$x \to +\infty$, $f(x) \to +\infty$, and as $x \to -\infty$, $f(x) \to +\infty$

x-intercepts:

$\left(\frac{-2+\sqrt{2}}{2}, 0\right), \left(-\frac{\sqrt{2}+1}{\sqrt{2}}, 0\right)$

y-intercepts: (0, 1)

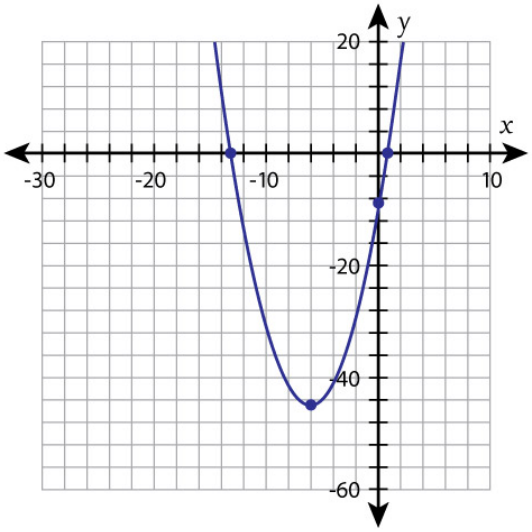
Domain:

[Solution: $-\infty < x < \infty$
Interval Notation: $(-\infty, \infty)$]

Range:

[Solution: $f(x) \geq -1$
Interval Notation: $[-1, \infty)$]

② $f(x) = x^2 + 12x - 9$



Vertex: (-6, -45)

Axis of Symmetry: $x = -6$

End behavior:

$x \to +\infty$, $f(x) \to +\infty$, and as $x \to -\infty$, $f(x) \to +\infty$

x-intercepts:

$(3(\sqrt{5} - 2), 0), (-3(2 + \sqrt{5}), 0)$

y-intercepts: (0, -9)

Domain:

[Solution: $-\infty < x < \infty$
Interval Notation: $(-\infty, \infty)$]

Range:

[Solution: $f(x) \geq -45$
Interval Notation: $[-45, \infty)$]