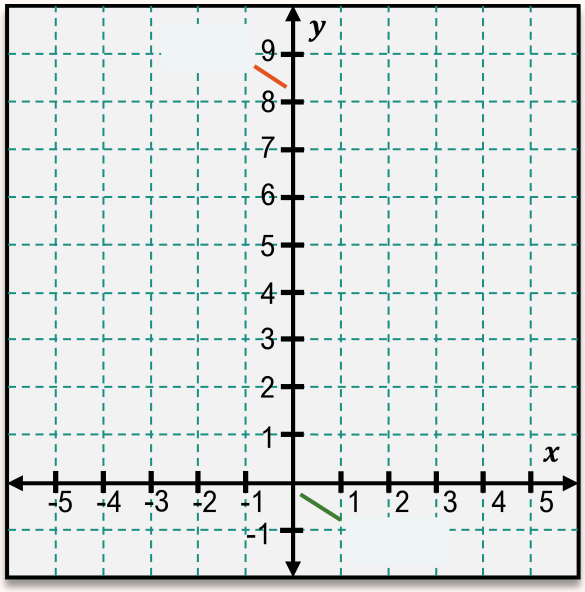
TOPIC: GRAPHING QUADRATIC EQUATIONS

Intro to Graphing Quadratic Equations

◆ A **Quadratic Equation** in two variables is written as New $y = ax^2 + bx + c$ where $a \neq 0$.

New Graphing Quadratics

$y = ax^2$	
x	$y = x^2$
– 3	
– 2	
– 1	
0	
1	
2	
3	



- Graph **shape** is a _____.
- When a is **[POSITIVE | NEGATIVE]** the graph opens **[UP | DOWN]**.
- **High/low point** is the _____.
- The **axis of symmetry** always passes through the _____.

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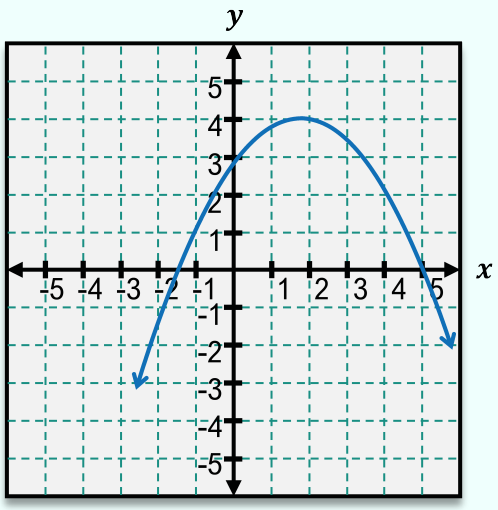
EXAMPLE Find the approximate axis of symmetry, vertex, and x-intercepts for the following graph.



PRACTICE Determine if the parabola opens up or down.

(***A***) $y = -2x^2 - 6x - 7$

(***B***) $y = \frac{1}{2}x^2 - 5x$

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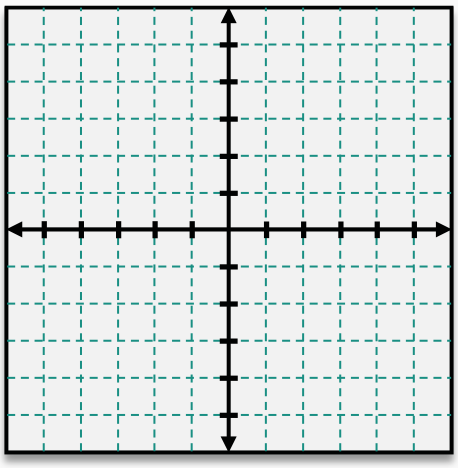
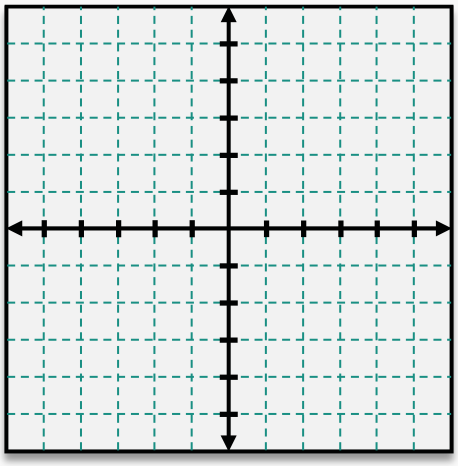
PRACTICE Graph each quadratic equation by finding and plotting ordered pair solutions.

(A) $y = -3x^2$



(B) $y = 2x^2 + 5$



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Graphing Using the Quadratic Formula

◆ Recall: The Quadratic Formula **Recall** $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ gives the solution(s) to the quadratic $0 = ax^2 + bx + c$.

New **Graphing Using the Quadratic Formula**

Find the vertex, intercepts, and axis of symmetry for the quadratic $y = 2x^2 + 12x + 10$

Discriminant	
+	2 x-int
0	1 x-int
–	0 x-int

$$x = \frac{-b}{2a} \pm \frac{\sqrt{b^2 - 4ac}}{2a}$$

x-intercept(s): _____
_____

$$x = \frac{-12}{2(2)} \pm \frac{\sqrt{12^2 - 4(2)(10)}}{2(2)}$$

$$x = \frac{-12}{4} \pm \frac{\sqrt{144 - 80}}{4} \quad 64$$

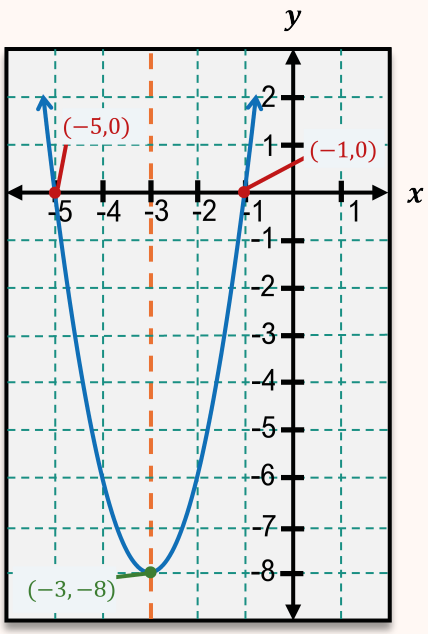
$$x = -3 \pm 2$$

Axis of Sym: _____

$$x = -1 \qquad x = -5$$

Vertex: _____

y-intercept(s): _____



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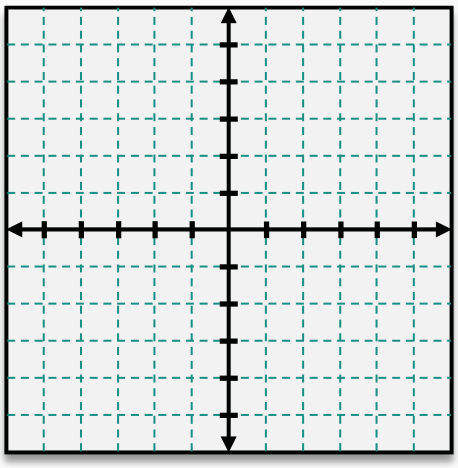
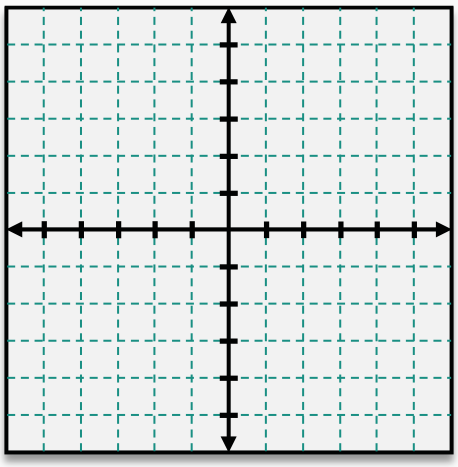
PRACTICE Graph the following quadratics and state its vertex and intercepts.

(A) $y = x^2 - 2x - 3$



(B) $y = -3x^2 + 10x - 3$



(C) $y = 4x^2 - 8x + 5$