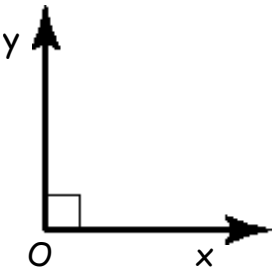
Name_____ Date:_____

§10-1 Midpoint and Distance Formulas

Goal 1: Find the _____ of a segment on the coordinate plane.

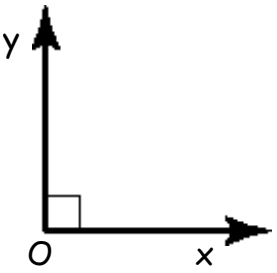
Goal 2: Find the _____ between two points on the coordinate plane.

Defn: Midpoint Formula: If a line segment has endpoints at (x_1, y_1) and (x_2, y_2), then the midpoint of the segment has coordinates _____.



Example: A graphing program draws a line segment on a computer screen so that its endpoints are at (5, 2) and (7, 8). What are the coordinates of its midpoint?

Defn: Distance Formula: The distance between two points with coordinates (x_1, y_1) and (x_2, y_2) is given by _____.



Example: Find the distance between P(–1, 4) and Q(2, –3).

A coordinate grid is placed over a scale drawing of Jenny's patio. A grill is located at (2, –3). A flowerpot is located at (–6, –1). A picnic table is at the midpoint between the grill and the flowerpot. In coordinate units, about how far is it from the grill to the picnic table?

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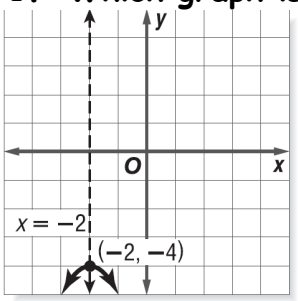
§5–7 Analyzing Graphs of Quadratic Functions & Vertex Form

Goals: • Write quadratic functions in _____ and graph.

Defn. Vertex form: _____, where the vertex of the equation is at point _____.

Ex 1. Which graph is the graph of $y = (x + 2)^2 - 4$?

A



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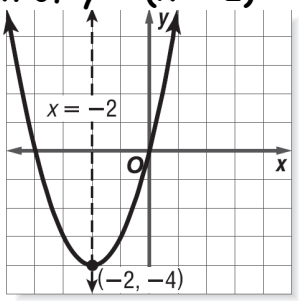
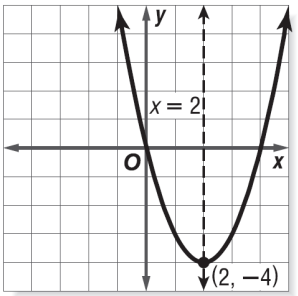


B



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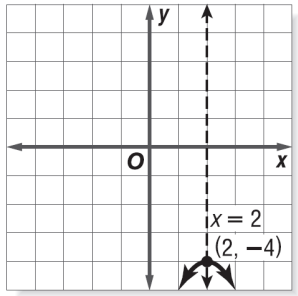

Steps to putting $y = ax^2 + bx + c$ in vertex form. **Ex 2: $y = x^2 + 2x + 4$**

1. **Move the constant to the "y side" $y - c = ax^2 + bx$**

2. **Factor.** $y - c = a(x^2 + \frac{b}{a}x)$

3. **Divide both sides by a.** $\frac{y - c}{a} = x^2 + \frac{b}{a}x$

4. **Complete the square.** $\frac{y - c}{a} + \left(\frac{b}{2a}\right)^2 = \left(x + \frac{b}{2a}\right)^2$

5. **Solve for y.**

Ex 3. $y = -2x - 4x + 2$

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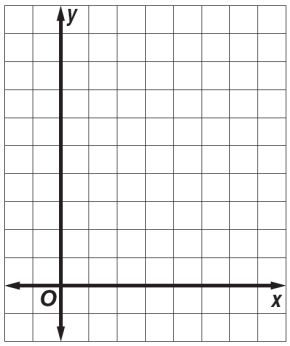
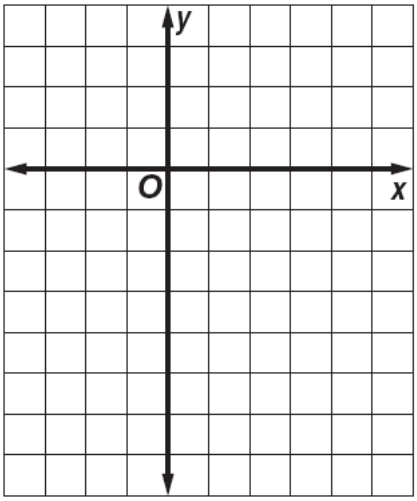
Graphing quadratic equations in vertex form:

1. **Plot the vertex.**
2. **Draw the axis of symmetry.**
3. **Make a table of values and use symmetry to complete the graph.**

Ex 4. Graph $y = (x - 3)^2 + 2$.



Ex. 5 Write each quadratic function in vertex form. Then graph the function.
$y = 3x^2 - 12x + 5$



Example 6. Review. Solve $y = 5x^2 - 10x + 9$ by completing the square.

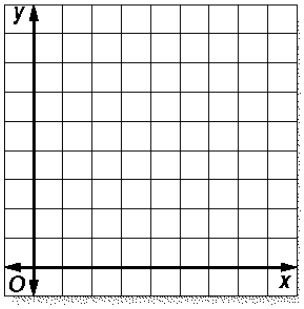
Name_____ Date:_____

§10-2 Parabolas

Goal 1: Write _____ of parabolas in standard form.

Goal 2: _____ parabolas.

Defns.: parabola _____

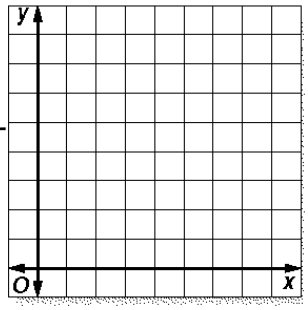


conic section _____

focus _____

directrix _____

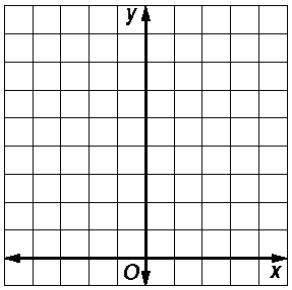
latus rectum _____



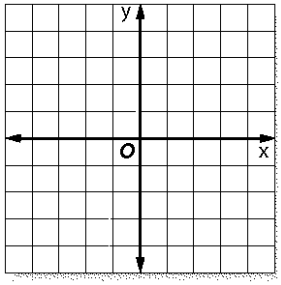
Standard("Vertex") Form of a parabola: _____

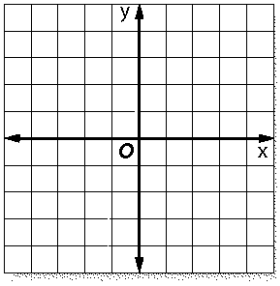
Examples: A) Write $y = -x^2 - 2x + 3$ in vertex form. Identify the vertex, axis of symmetry, and direction of opening of the parabola.

B) Graph $y = 2x^2$



C) Graph $y = 2(x-1)^2 - 5$





Information about Parabolas		
Form of Equation	**$y = a(x - h)^2 + k$**	**$x = a(y - k)^2 + h$**
Vertex		
Axis of Symmetry		
Focus		
Directix		
Direction of Opening		
Length of Latus Rectum		

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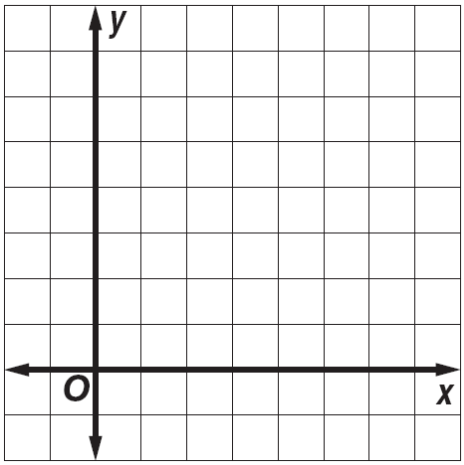
§5-8 Graphing and Quadratic Inequalities

To graph quadratic inequalities graph the boundary _____.

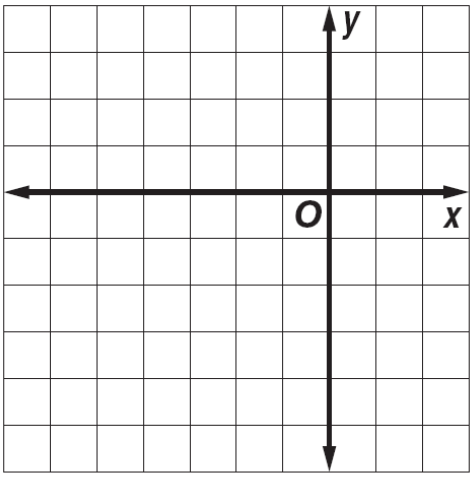
Solid if _____ Dotted if _____.

Plug in a point _____ if true shade_____ if false _____.

Ex 1. Graph $y > x^2 - 8x + 17$

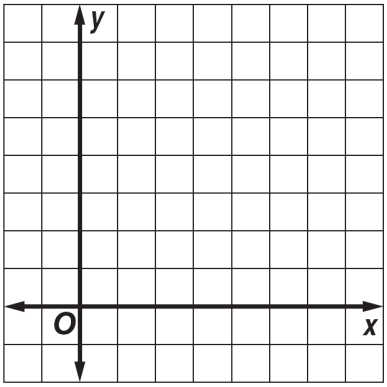


Ex 2. Graph $y > x^2 - 8x + 17$



Ex 3. Graph

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



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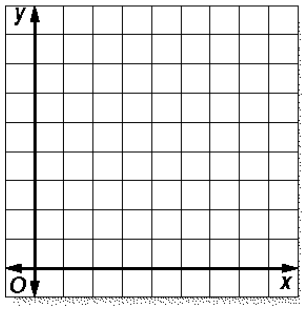
§10-3 Circles



Goal: _____ and _____ equations of circles.

Defn. Equation of a circle: With center (h, k) and radius r:

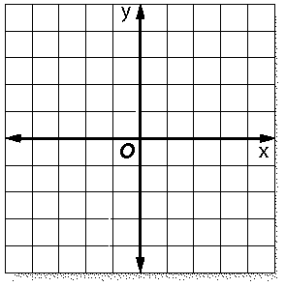
_____.

Examples:

A) The plan for a park puts the center of a circular pond of radius 0.6 mile, 2.5 miles east and 3.8 miles south of the park headquarters. Write an equation to represent the border of the pond, using the headquarters as the origin.

B) Write an equation for a circle if the endpoints of the diameter are at (2, 8) and (2, –2).

C) Find the center and radius of the circle with equation $x^2 + y^2 = 16$. Then graph the circle.



D) Find the center and radius of the circle with equation $x^2 + y^2 + 6x - 7 = 0$. Then graph the circle.