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Chapter 9A

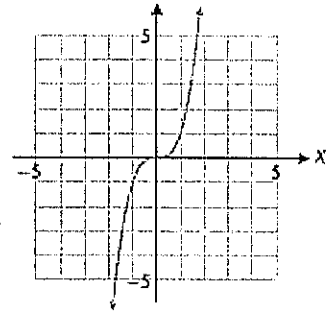
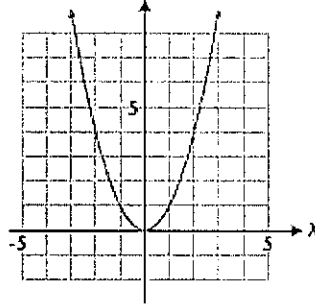
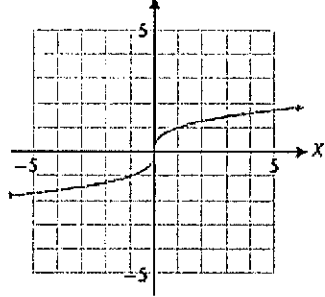
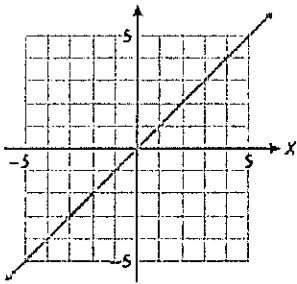
Quadratics

Lesson 9-1: Identifying Quadratic Functions

Vocabulary

Quadratic Function: _____

Quadratic **GRAPHS** & non-quadratic graphs...



Quadratic **TABLES** & non-quadratic tables...

$$y = 2x + 1$$

$$y = x^2 - 3$$

$$y = 2^x - 3$$

Quadratic **EQUATIONS** & non-quadratic equations...

$$y = 7x + 3$$

$$y + x = 2x^2$$

$$x - 4x^2 + 6 = y$$

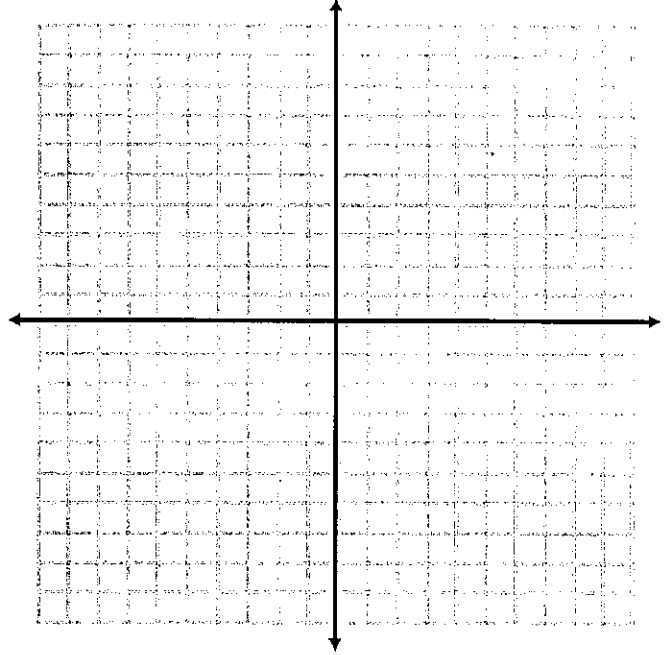
$$y - 10x^2 = g$$

$$y = 2x^3 + 3x^2 - x + 5$$

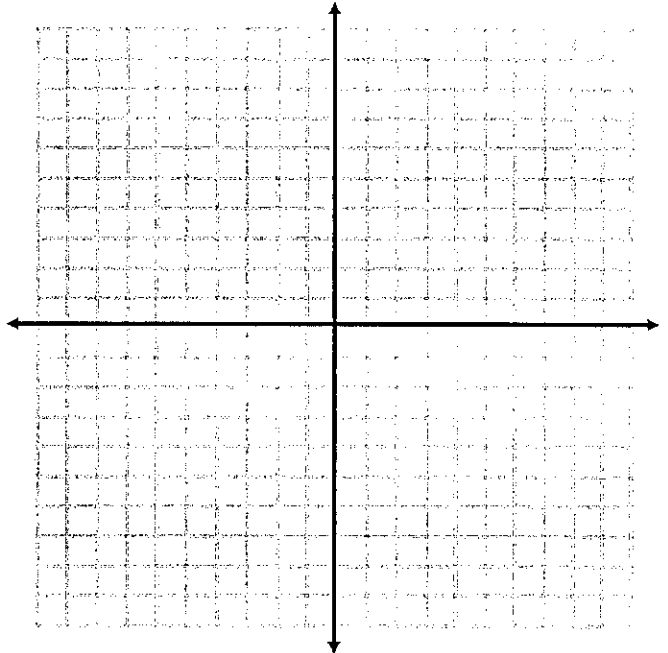
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Practice

1. Graph the function $y = x^2 + 2$
(Hint: pick enough points so that you can see BOTH sides of the curve!)



2. Graph the function $y = -2x^2 + 2x - 1$



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CHARACTERISTICS OF A PARABOLA

Parabolas can open UP or DOWN...

Using the standard form for a quadratic function: $y = ax^2 + bx + c$

If 'a' is _____, the parabola will open _____.

If 'a' is _____, the parabola will open _____.

.....

Parabolas can be SKINNY or WDE...

Using the standard form for a quadratic function: $y = ax^2 + bx + c$

***Ignore the negative sign, simply look at the # for 'a'...

If 'a' is _____ than 1, the parabola will be _____.

If 'a' is _____ than 1, the parabola will be _____.

Practice

For each quadratic, tell if the parabola will open UP or DOWN, and if it will be SKINNY or WIDE.

1. $y = -4x^2 - x + 1$

2. $y - \frac{1}{3}x^2 = x - 3$

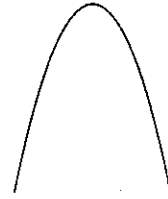
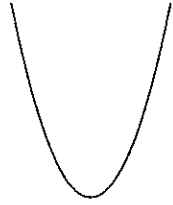
3. $y = 5x - 3x^2$

4. $y - 5x^2 = 2x - 6$

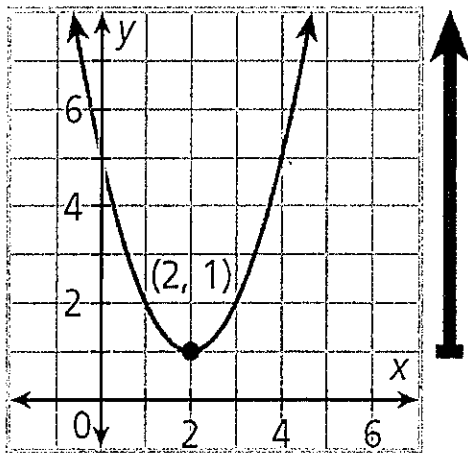
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Parabolas can have a MINIMUM or MAXIMUM...

Look at the VERTEX of the quadratic...



Parabolas have a DOMAIN (all possible _____) and RANGE (all possible _____)...



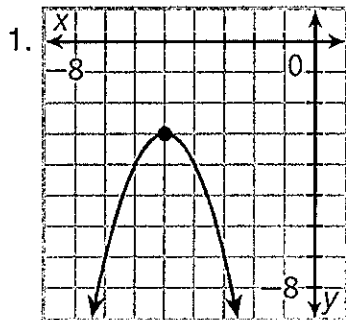
Unless a specific domain is given, the domain will always be...

DOMAIN = _____

The range is based on the max or min...

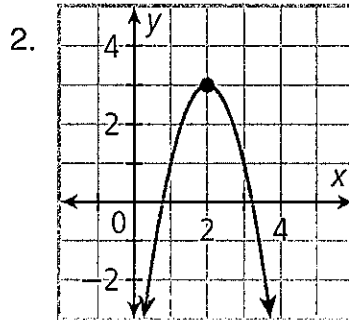
RANGE = _____

Practice



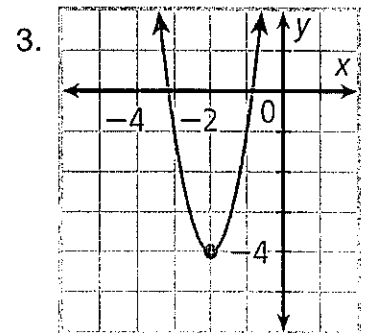
D =

R =



D =

R =



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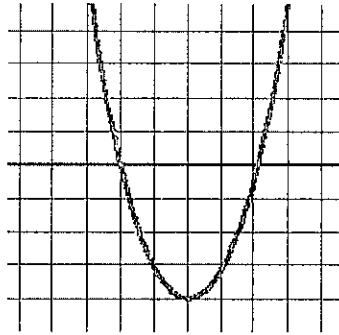
R =

Lesson 9-2: Zeros of a Quadratic

Vocabulary

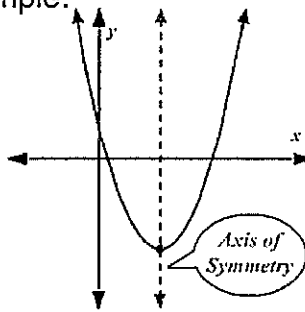
Zero of a function/ x -intercepts/roots: _____

Example:



Axis of Symmetry: _____

Example:



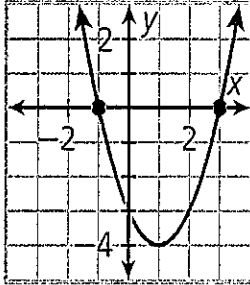
The axis of symmetry always goes through the _____, and always has the equation _____

Finding the Axis of Symmetry by Using Zeros		
Words	Numbers	Graph
One Zero		
Two Zeros		

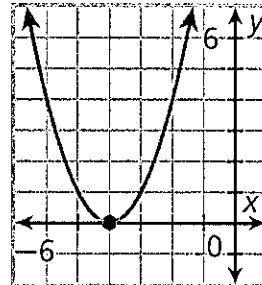
Practice

Use the graph to find the zeroes. Verify algebraically.

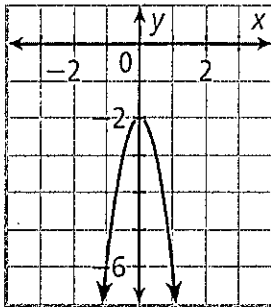
1. $y = x^2 - 2x - 3$



2. $y = x^2 + 8x + 16$

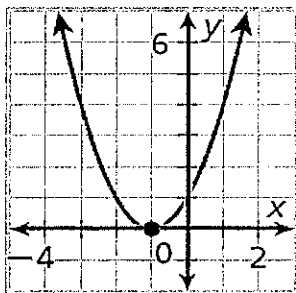


3. $y = -4x^2 - 2$

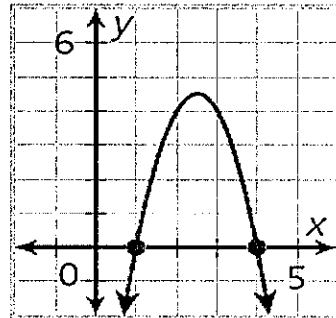


Find the axis of symmetry for each parabola.

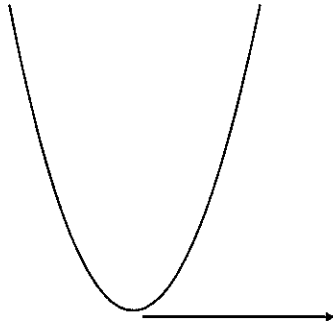
4.



5.



Calculating the Vertex



Standard Form: $y = ax^2 + bx + c$

Example: $y = 3x^2 + 12x - 5$

a = _____
b = _____
c = _____

FINDING THE VERTEX

1) Find h.

$$h = \frac{-b}{2a} \longrightarrow \underline{\hspace{2cm}} \qquad h = \underline{\hspace{2cm}}$$

2) Find k by plugging 'h' value in for 'x' in original equation.

$$k = 3(\underline{\hspace{1cm}})^2 + 12(\underline{\hspace{1cm}}) - 5 \qquad k = \underline{\hspace{2cm}}$$

The vertex is _____.

The axis of symmetry is _____.

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Practice

Find the vertex.

1) $y = x^2 - 4x + 1$

2) $y = -2x^2 - 8x + 1$

3) $y = 4x^2 - x - 3$

4) $y = 4x^2 + 6$

5) $y = x^2 - x$

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Vertex Form

Vertex Form of a Parabola:

$$y - k = a(x - h)^2$$

Practice

Convert each to vertex form.

1) $y = x^2 + 12x + 40$

2) $y = x^2 - 6x - 40$

3) $y = \frac{1}{4}x^2 - 3x + 2$

4) $y = -x^2 - 16x - 68$