

Chapter 7: Quadratics

Name: _____

Notes 7.2 Analyzing a Graph

Quadratic =

NOT

Parabola =

Regular Pattern:

Vertex =

Minimum or Maximum

Axis of Symmetry =

Equation for the Axis of Symmetry:

Domain =

All quadratic equations have a domain of _____

Range =

All quadratic equations have a range limited by _____

Intercepts =

*Y-Intercept =**X-Intercept =*

Vertex Form =

The vertex form is used for _____

Standard Form =

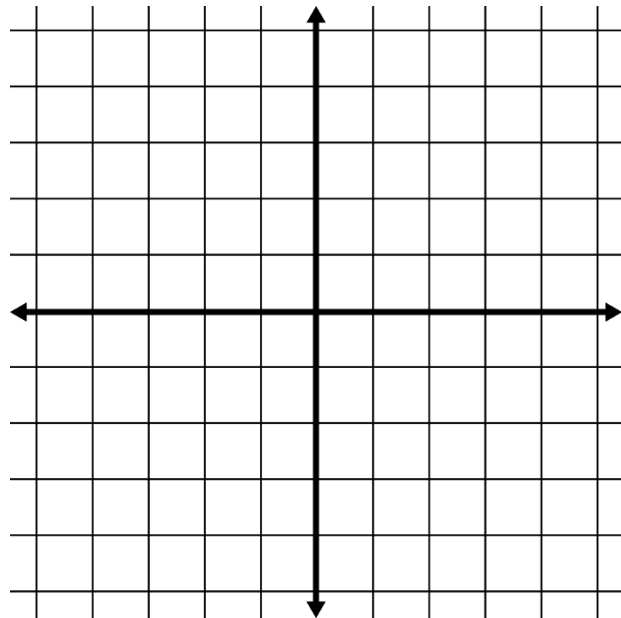
The standard form is _____

Using your calculator:

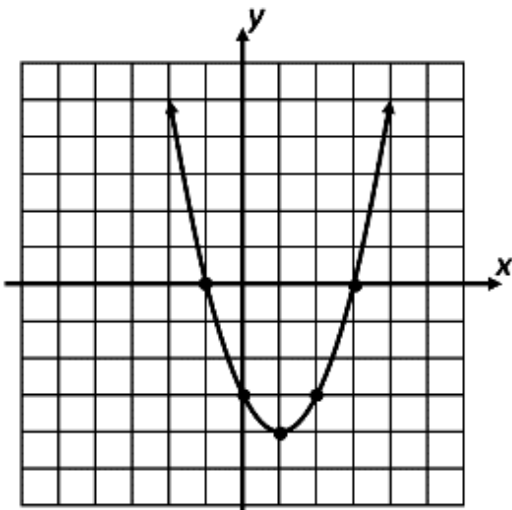
Example #1: Create a table of values and graph the parabola

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

x	y



Example #2: Analyze the graph and write an equation to match:



Vertex:

Axis of Symmetry:

Y-Intercept:

X-Intercepts:

Domain:

Range:

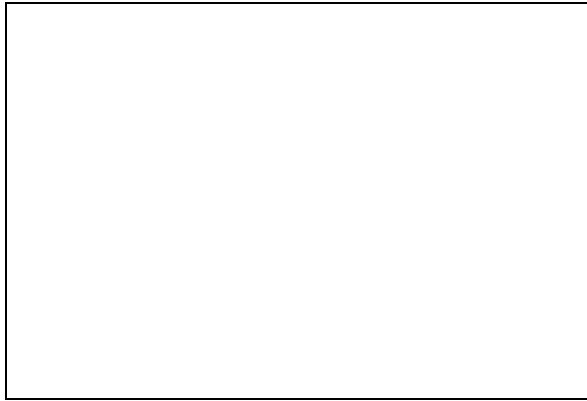
Pattern:

Equation:

Example #3: Analyze the equation $y + 4 = 2(x - 2)^2$

a) Arrange the equation so that it follows the vertex form of $y = a(x - p)^2 + q$

b) Sketch the graph and indicate your window size:



c) Use your calculator to determine the vertex:

d) What is the equation for the Axis of Symmetry?

e) What are the x and y intercepts for the graph?

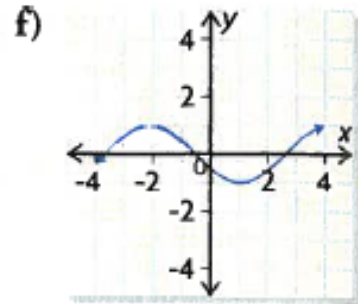
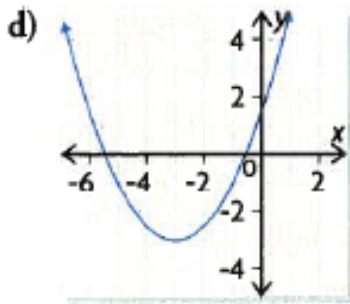
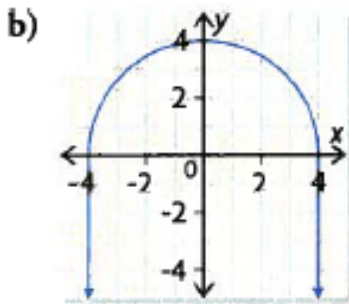
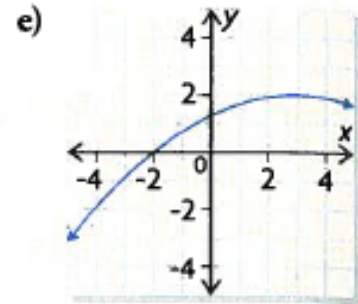
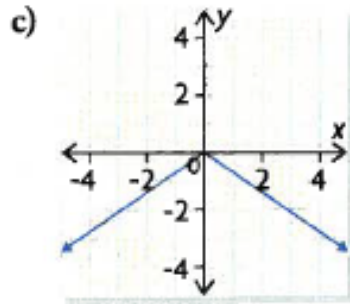
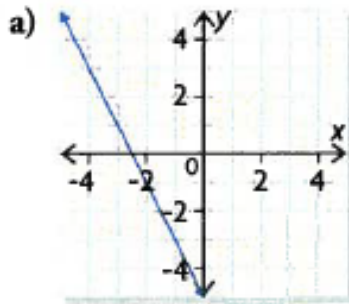
e) What is the domain and range of the graph?

f) What is the pattern that each value goes up by?

Assignment

Part 1:

1) Which graphs appear to represent quadratic relations? (parabolas)



2) Which of the following relations are quadratic?

- a) $y = 2x - 7$
- b) $y = 2x(x + 3)$
- c) $y = (x + 4)^2 + 1$
- d) $y = x^2 - 5x - x$
- e) $y = 4x^3 + x^2 - x$
- f) $y = x(x + 1)^2 - 7$

3) Find the y-intercept for each quadratic relation in #2 (HINT: when $x = 0$)

- a)
- b)
- c)
- d)
- e)
- f)

4) Explain why a cannot be zero for a quadratic in the form of
 $y = ax^2 + bx + c$

5) Does the parabola open up or down?

a) $y = x^2 - 4$

b) $y = -2x^2 + 6x$

c) $y = 9 - x + 3x^2$

d) $y = -\frac{2}{3}x^2 - 6x + 1$

6) Does each parabola open up or down?

a)

x	-4	-3	-2	-1	0	1
y	12	5	0	-3	-4	-3

b)

x	0	1	2	3	4	5
y	-13	-3	3	5	3	-3

c)

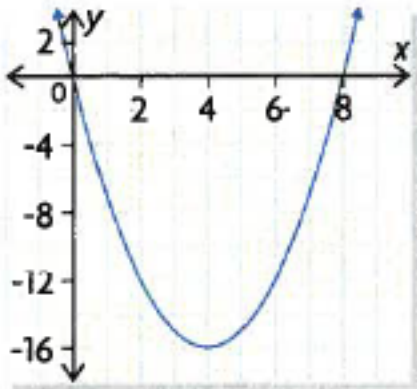
x	-5	-4	-3	-2	-1	0
y	3.0	-0.5	-3.0	-4.5	-5.0	-4.5

d)

x	0	1	2	3	4	5
y	-4	19	40	59	76	91

Part 2:

1) Analyze the following parabola:



- a) equation of the axis of symmetry = _____
- b) Vertex: _____
- c) Domain: _____ Range: _____

2) State the coordinates of the y-intercept and two additional points for each function

a) $f(x) = 2x^2 + 8x + 8$

y-intercept = _____
two other points

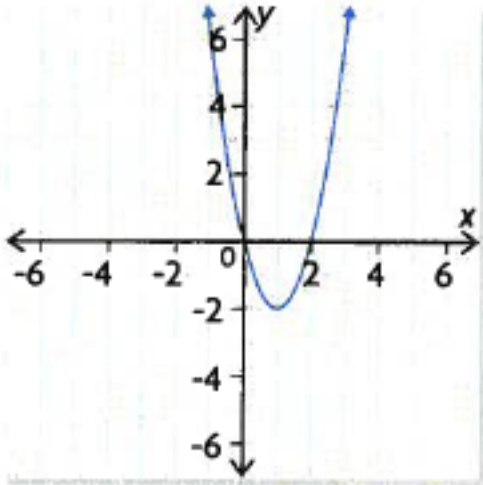
x	y

b) $f(x) = 4x - x^2$

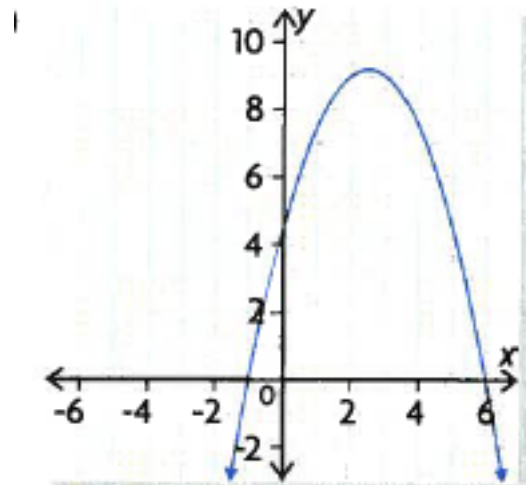
y-intercept = _____
two other points

x	y

3) Analyze each of the following



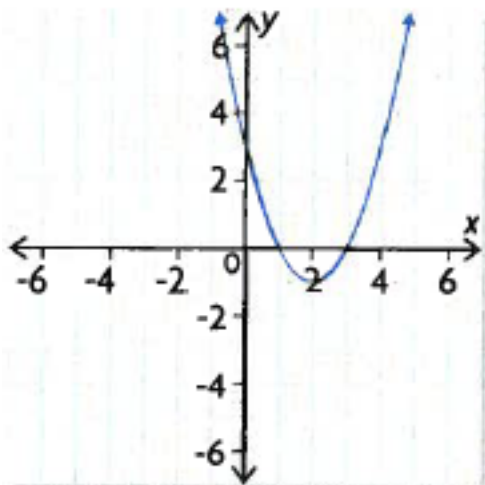
x-intercept	
y-intercept	
Axis of Symmetry	
Vertex	
Domain	
Range	



x-intercept	
y-intercept	
Axis of Symmetry	
Vertex	
Domain	
Range	

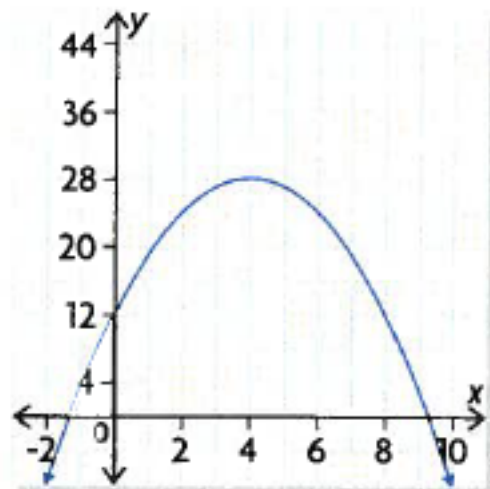
4) Analyze each of the following:

a)



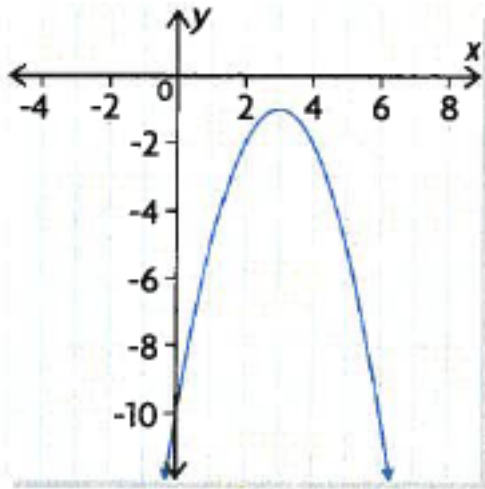
Axis of Symmetry	
Vertex	
Domain	
Range	

b)



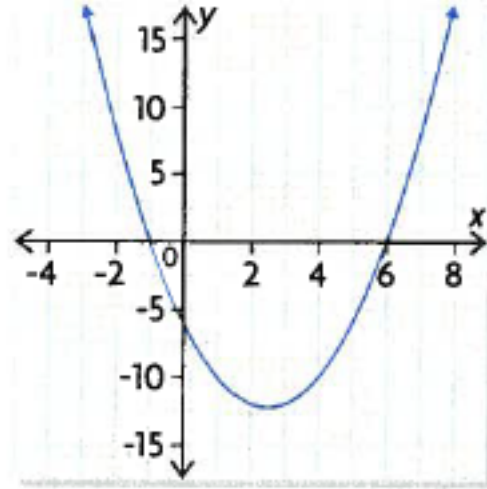
Axis of Symmetry	
Vertex	
Domain	
Range	

c)



Axis of Symmetry	
Vertex	
Domain	
Range	

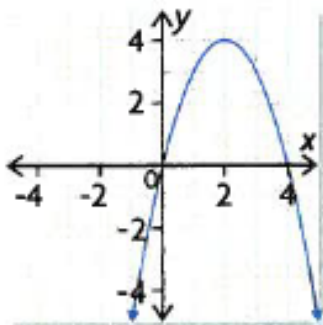
d)



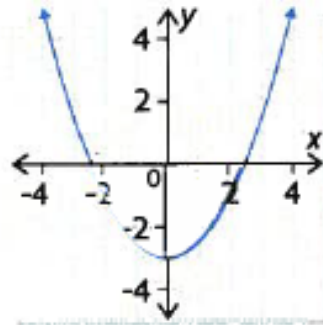
Axis of Symmetry	
Vertex	
Domain	
Range	

6) Find the minimum or maximum value

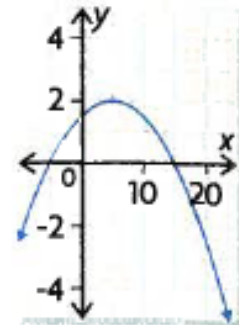
a)



b)



c)



Answers:

Part 1

1. a) not a quadratic relation d) quadratic relation
 b) not a quadratic relation e) quadratic relation
 c) not a quadratic relation f) not a quadratic relation
2. a) not a quadratic relation d) quadratic relation
 b) quadratic relation e) not a quadratic relation
 c) quadratic relation f) not a quadratic relation
3. b) 0 c) 17 d) -6
4. e.g., If $a = 0$, then $y = bx + c$, which is a linear relation, not a quadratic relation.
5. a) up, $a > 0$ c) up, $a > 0$
 b) down, $a < 0$ d) down, $a < 0$
6. a) up c) up
 b) down d) down

Part 2

1. a) $x = 4$ c) $\{(x, y) \mid x \in \mathbb{R}, y \geq -16, y \in \mathbb{R}\}$
 b) $(4, -16)$
2. a) $(0, 8)$; e.g., $(1, 18), (-1, 2)$ b) $(0, 0)$; e.g., $(1, 3), (-1, -5)$
3. a) $(0, 0), (2, 0)$; $(0, 0); x = 1; (1, -2)$; $\{(x, y) \mid x \in \mathbb{R}, y \geq -2, y \in \mathbb{R}\}$
 b) $(-1, 0), (6, 0)$; $(0, 4.5); x = 2.5; (2.5, 9.2)$;
 $\{(x, y) \mid x \in \mathbb{R}, y \leq 9.2, y \in \mathbb{R}\}$
4. a) $x = 2; (2, -1)$; $\{(x, y) \mid x \in \mathbb{R}, y \geq -1, y \in \mathbb{R}\}$
 b) $x = 4; (4, 28)$; $\{(x, y) \mid x \in \mathbb{R}, y \leq 28, y \in \mathbb{R}\}$
 c) $x = 3; (3, -1)$; $\{(x, y) \mid x \in \mathbb{R}, y \leq -1, y \in \mathbb{R}\}$
 d) $x = 2.5; (2.5, -12.25)$; $\{(x, y) \mid x \in \mathbb{R}, y \geq -12.25, y \in \mathbb{R}\}$
5. a) graph d; $(2.5, -12.25)$ c) graph c; $(3, -1)$
 b) graph b; $(4, 28)$ d) graph a; $(2, -1)$
6. a) maximum of 4 b) minimum of -3 c) maximum of 2

