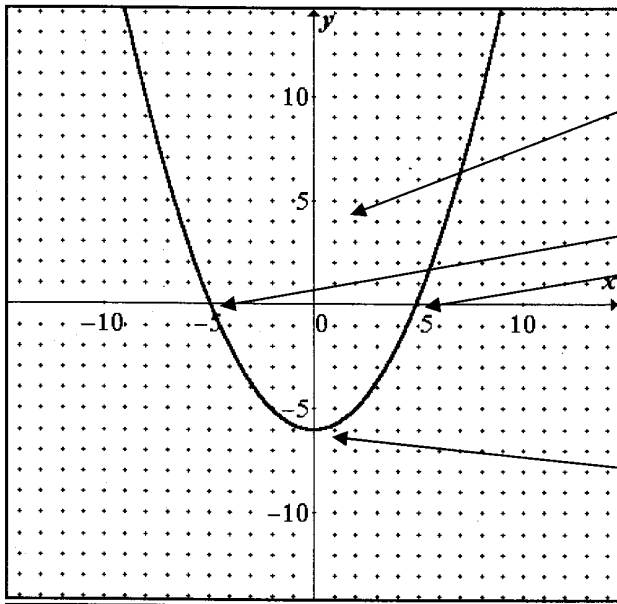


The Basic Quadratic Function



direction of opening –
 either concave up or
 down
here – concave up

zeros or x -intercepts
 -they don't always exist

vertex – the point where the
 graph “changes direction”
 Can be a minimum or a
 maximum point.

Part 1

1. Using the graphing calculator, graph the following equations on the same set of axes. **Label each parabola with its corresponding equation.**

$y = x^2$

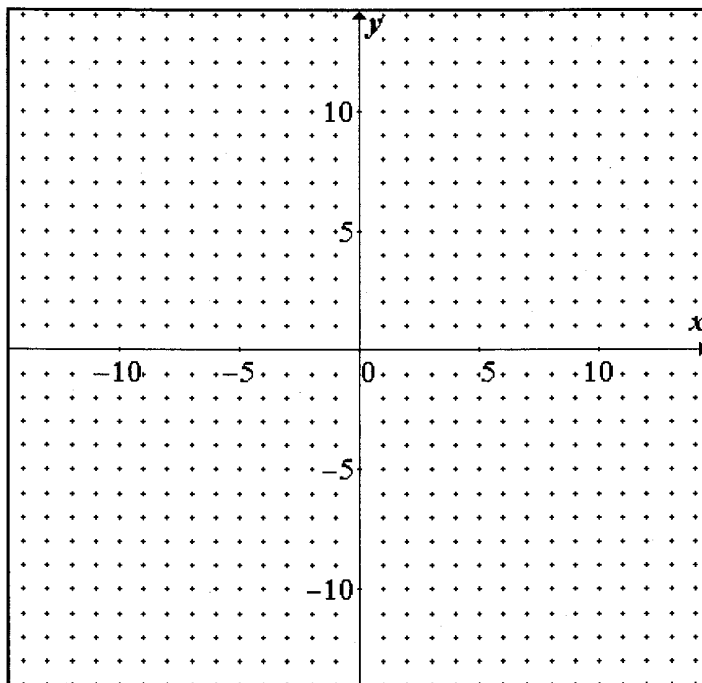
$y = x^2 + 4$

$y = x^2 + 7$

$y = x^2 - 2$

$y = x^2 - 5$

$y = x^2 + 1$



2. For each curve in question #1, complete the chart:

Equation	vertex	x-intercepts (if any)	y-intercept	direction that curve opens	equation of axis of symmetry
$y = x^2$					
$y = x^2 + 4$					
$y = x^2 + 7$					
$y = x^2 - 2$					
$y = x^2 - 5$					
$y = x^2 + 1$					

3. Describe the effect of various values of "q" on the graph of

$$y = x^2 + q$$

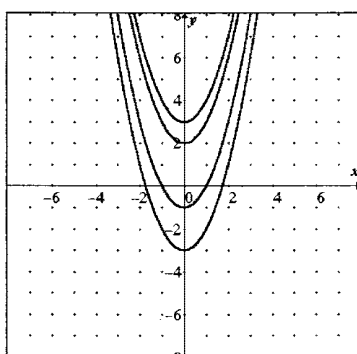
4. Which graph best represents each of the following. (Label the graph with the appropriate letter)

a) $y = x^2 + 3$

b) $y = x^2 - 3$

c) $y = x^2 - 1$

d) $y = x^2 + 2$



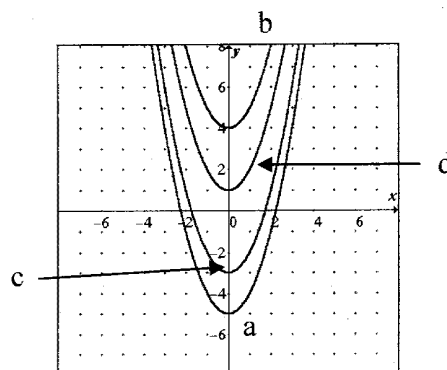
5. Write an equation that could correspond to each graph:

a) _____

b) _____

c) _____

d) _____



6. Fill in the following chart:

Equation	direction of opening	coordinates of vertex	x-intercepts (if any)	y-intercept
$y = x^2 + 5$				
$y = x^2 - 3$				
$y = x^2 + 2$				
$y = x^2 + 4$				

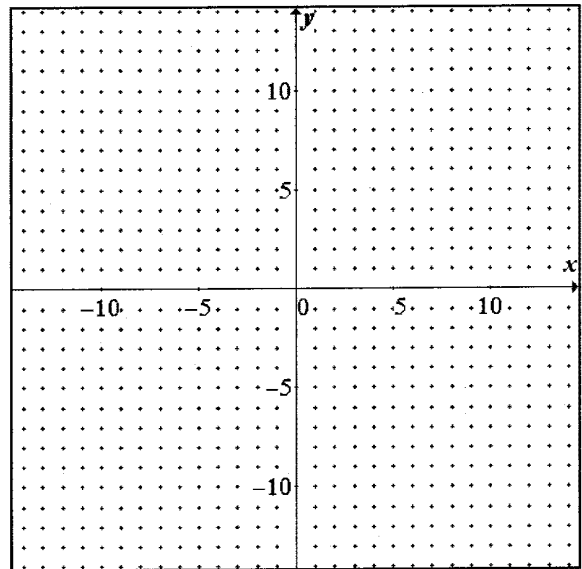
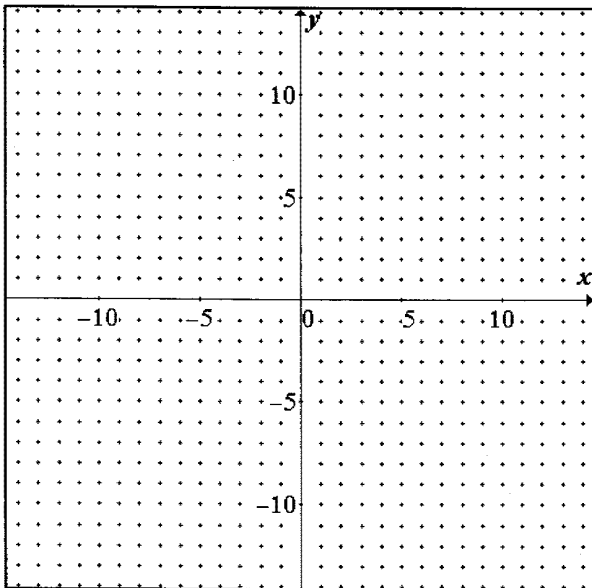
7. For the general quadratic $y = x^2 + q$:

- a) What are the co-ordinates of the vertex? _____
 b) What restriction on the value of 'q' exists in order for x-intercepts to exist? _____

8. *Without using the graphing calculator*, sketch each of the following on the same set of axes. **Label each parabola with its corresponding equation.**

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

b) $y = x^2$ $y = x^2 - 3$, $y = x^2 - 5$, $y = x^2 + 2$

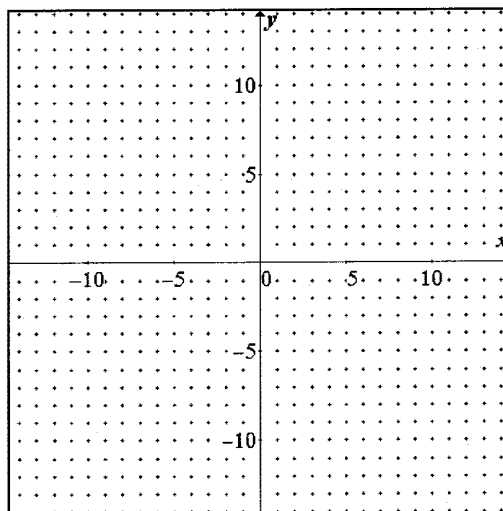
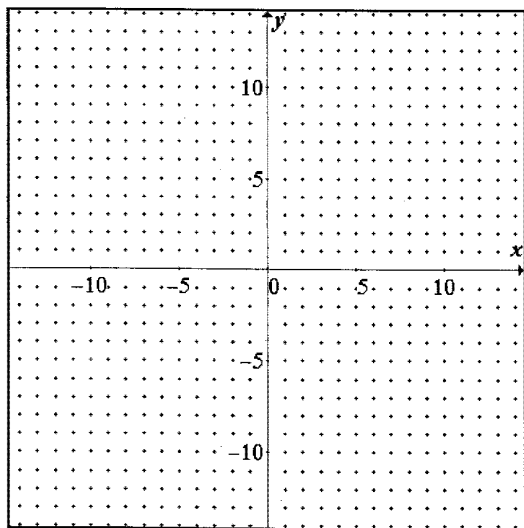


Part 2

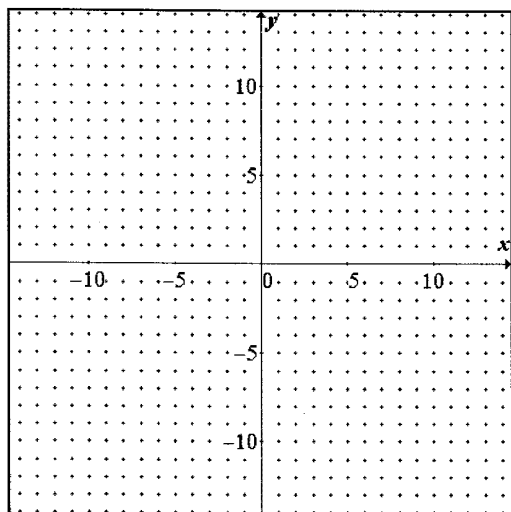
1. Use the graphing calculator to sketch a graph of each of the following on the given sets of axes. **Label each parabola with its corresponding equation.**

a) $y = x^2$, $y = (x - 2)^2$, $y = (x + 4)^2$

b) $y = x^2$, $y = (x + 3)^2$, $y = (x - 6)^2$



c) $y = x^2$, $y = (x - 4)^2$, $y = (x + 6)^2$



2. Complete the chart for each equation.

Equation	vertex	equation of axis of symmetry	x-intercepts (if any)	y-intercept
$y = x^2$				
$y = (x - 2)^2$				
$y = (x + 4)^2$				
$y = (x + 3)^2$				
$y = (x - 6)^2$				
$y = (x - 4)^2$				
$y = (x + 6)^2$				

3. Compare the graphs of $y = x^2$ and $y = (x - p)^2$ when:

a) $p > 0$

b) $p < 0$

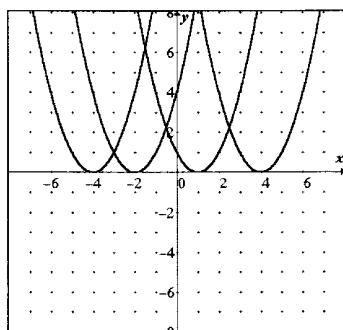
4. Which graph best represents each of the following. Label with appropriate letter.

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

b) $y = (x + 2)^2$

c) $y = (x + 4)^2$

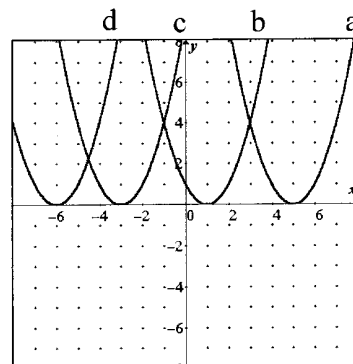
d) $y = (x - 4)^2$



5. Write an equation that could correspond to each graph:

a) _____ b) _____

c) _____ d) _____

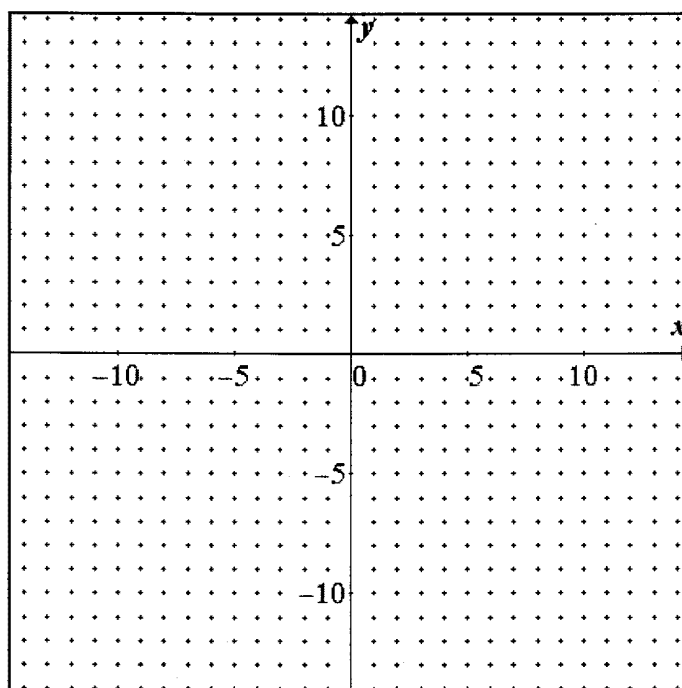


6. Complete the following chart:

Equation	co-ordinates of vertex	equation of axis of symmetry	direction of opening	x-intercept (if any)	y-intercept
$y = x^2$					
$y = (x + 3)^2$					
$y = (x - 8)^2$					
$y = (x - 2)^2$					
$y = (x + 4)^2$					

7. Without using a graphing calculator, sketch the graphs of the following. **Label each parabola with its corresponding equation.**

a) $y = x^2$ b) $y = (x - 2)^2$ c) $y = (x + 5)^2$ d) $y = (x - 6)^2$ e) $y = (x + 2)^2$

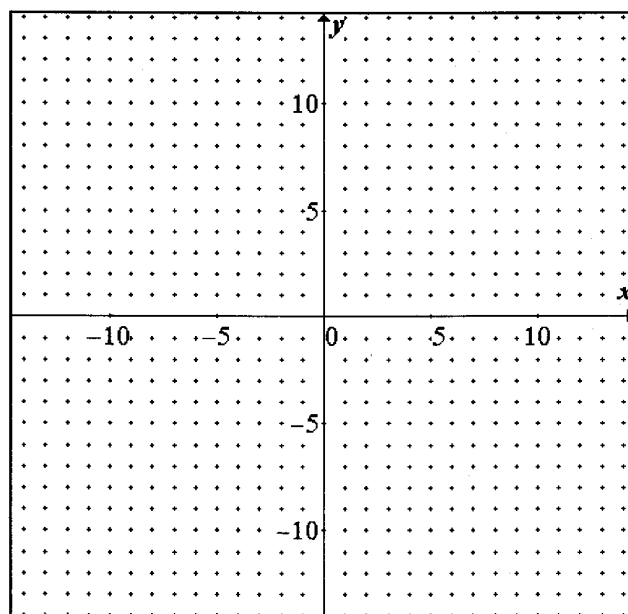


Date: _____

Part 3

1. Using the graphing calculator, graph each of the following on the same set of axes. **Label each parabola with its corresponding equation.**

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



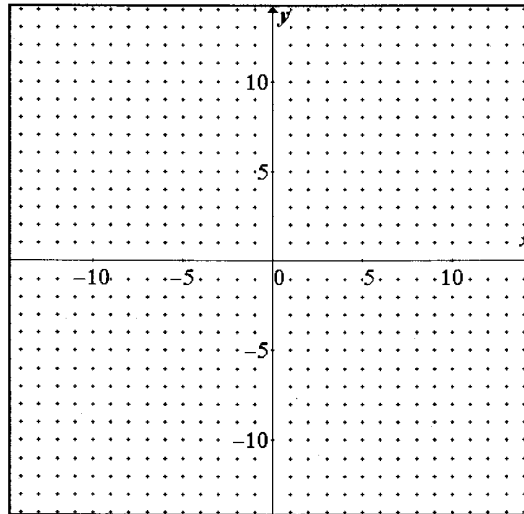
2. Complete the following table:

Equation	co-ordinates of the vertex	direction of opening	y-intercept
$y = x^2$			
$y = 3x^2$			
$y = \frac{1}{2}x^2$			
$y = -x^2$			
$y = -4x^2$			
$y = -\frac{1}{3}x^2$			

3. Describe the effect on the graph of $y = ax^2$ as the value of "a" varies.

4. Without using a graphing calculator, sketch the parabolas on the same set of axes. **Label each parabola with its corresponding equation.**

$$y = x^2 \quad y = -x^2 \quad y = \frac{1}{5}x^2 \quad y = -3x^2$$



5. All parabolas with the vertex $(0,0)$ have the general equation $y = ax^2$. If we are given a point that the parabola passes through, we can determine the value of 'a'. Determine the equations of the parabolas with vertex $(0, 0)$ that passes through the given points:

a) $(3,18)$

b) $(4,-16)$

c) $(2,24)$

d) $(2,-10)$

e) $\left(\frac{3}{2}, \frac{1}{3}\right)$