MA 103 Quadratic Functions and their Graphs
Section 8.6

I. Given a quadratic function in the form $y = f(x) = a(x-h)^2 + k$,

- The graph is always a parabola
- The vertex occurs at (h, k)
- The direction of opening is upward if a > 0 and downward if a < 0
- The y-intercept is found by substituting x = 0 into the function and finding $f(0)$
- The domain is $(-\infty, \infty)$
- The range of the function can be determined from the graph

For each quadratic function below,

(a) State the coordinates of the vertex.
(b) State the direction of opening .
(c) Find the y-intercept.
(d) Sketch the graph. **DO NOT USE YOUR CALCULATOR.**
(e) State the domain.
(f) State the range.

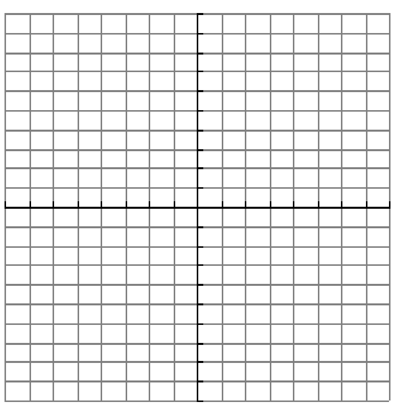
1. $f(x) = (x-2)^2 - 9$

(a)

(b)

(c)

(d)



(e)

(f)

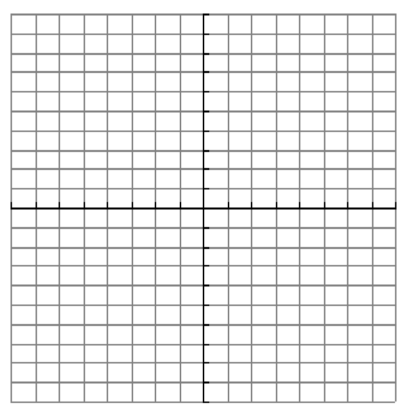
2. $g(x) = -3(x+1)^2 - 6$

(a)

(b)

(c)

(d)



(e)

(f)

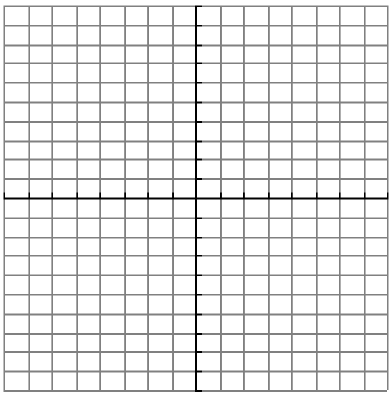
3. $h(x) = 2x^2 + 3$

(a)

(b)

(c)

(d)



(e)

(f)

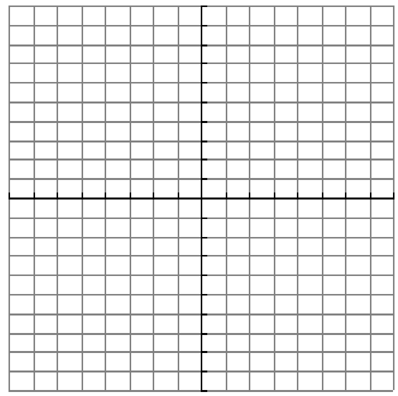
4. $f(x) = 3(x - 4)^2$

(a)

(b)

(c)

(d)



(e)

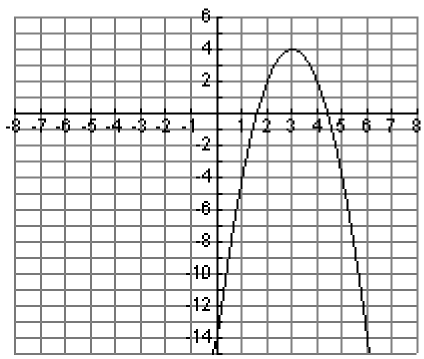
(f)

5. Match the equation with the corresponding graph from those shown below. **DO NOT USE YOUR CALCULATOR TO GRAPH THE FUNCTIONS.**

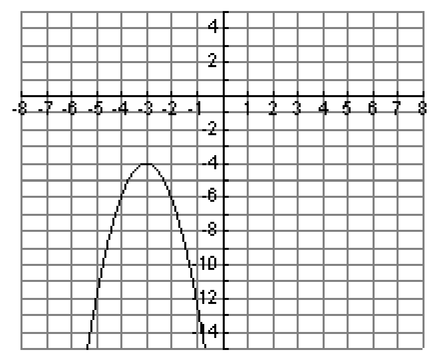
(a) $f(x) = 2(x+3)^2 - 4$ (b) $f(x) = -2(x+3)^2 - 4$ (c) $f(x) = 2(x-3)^2 + 4$

(d) $f(x) = -2(x+3)^2 + 4$ (e) $f(x) = -2(x-3)^2 + 4$ (f) $f(x) = 2(x-3)^2 - 4$

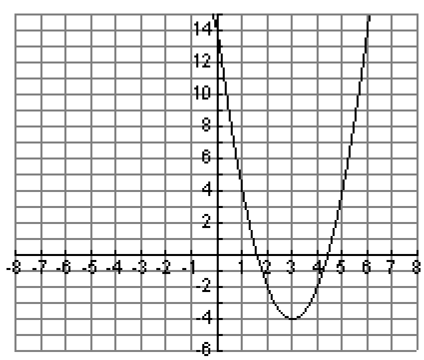
(i)



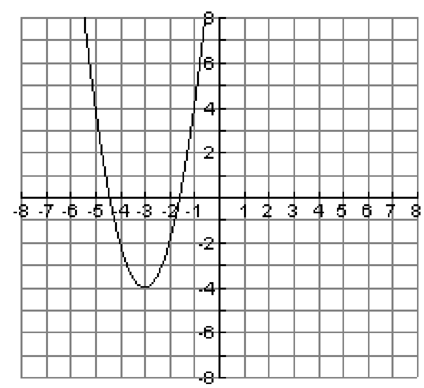
(ii)



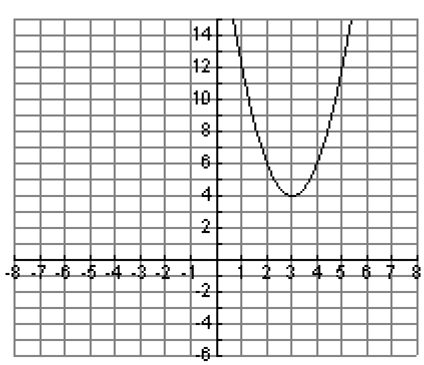
(iii)



(iv)



(v)



(vi)