Chapter 6 Review: Quadratic Functions

1. Which is the vertex for the quadratic function $y = -3(x-5)^2 + 7$?   1._____

  (A) $(-5,-7)$ (B) $(-5,7)$ (C) $(5,-7)$ (D) $(5,7)$

2. Which is a quadratic function?   2._____

  (A) $y = 5(x-3) + 7$ (B) $y = 2(x-3)^2(x+1)$ (C) $y = 2x^2(x+1)^2$ (D) $y = x(x+1)$

3. Which is the y–intercept for the quadratic function $f(x) = 4(x-1)(2x+3)$?   3._____

  (A)   1   (B)   –3   (C)   –12   (D)   0

4. Which represents the range for the graph?   4._____

    (A) $y \leq 9$

    (B) $y \leq 12$

    (C) $-2 \leq y \leq 6$, $y \varepsilon R$

    (D) $y \varepsilon R$

5. Which statement about the quadratic function $y = 5x^2 + 7x - 11$ with vertex $(-3, -27)$ is correct?   5._____

    (A) There is a minimum value of –27.   (B) There is a minimum value of –3.

    (C) There is a maximum value of –27.   (D) There is a maximum value of –3.

6. A parabola has x–intercepts at – 6 and 2. Which represents the function in Factored Form?   6._____

    (A) $y = a(x+6)(x-2)$ (B) $y = a(x-6)(x+2)$

    (C) $y = a(x-6)(x-2)$ (D) $y = a(x+6)(x+2)$
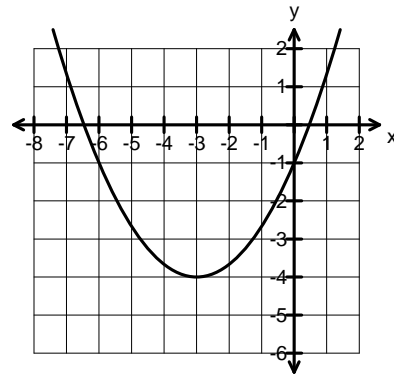
7. Which is the function in Vertex Form represented by the graph?　　　　　　　　　　　7._____

(A) $y = \dfrac{1}{3}(x+3)^2 - 4$　　　　　(C) $y = \dfrac{1}{3}(x-3)^2 - 4$

(B) $y = -\dfrac{1}{3}(x-3)^2 - 4$　　　　(D) $y = -\dfrac{1}{3}(x+3)^2 - 4$

8. Which is the equation of the axis of symmetry for the function $y = -3x^2 - 6x + 7$?　　8._____

(A) $x = -1$　　　　(B) $x = 2$　　(C) $x = 1$　　　　(D) $x = -2$

9. Which represents the number of x-intercepts for the function $y = -\dfrac{1}{3}(x+3)^2 - 4$.　　9._____

(A) 1　　　　　(B) 2　　　　(C) 3　　　　　(D) none

10. The area of a rectangular enclosure is given by the function $A(x) = -5x^2 + 150x$, where x is the width, in meters. What is the width that will produce a maximum area?　　10._____

(A) 15m　　　　(B) 5m　　(C) 150m　　　　(D) 30m

11. The Beatles Fan Club has 6000000 members and charges $5.00 per month. If the Club raises membership fees by $1.00 per month they expect 10000 fewer members per month. Which represents the revenue function?　　11._____

(A) $R = (6000000 + 1x)(5 - 10000x)$　　　　(B) $R = (6000000 - 1x)(5 + 10000x)$
(C) $R = (6000000 + 10000x)(5 - 1x)$　　　　(D) $R = (6000000 - 10000x)(5 + 1x)$

12. A farmer constructs a rectangular enclosed fence in an open field using 100m of fencing. Which quadratic function models the maximum area of the enclosed region?　　12._____
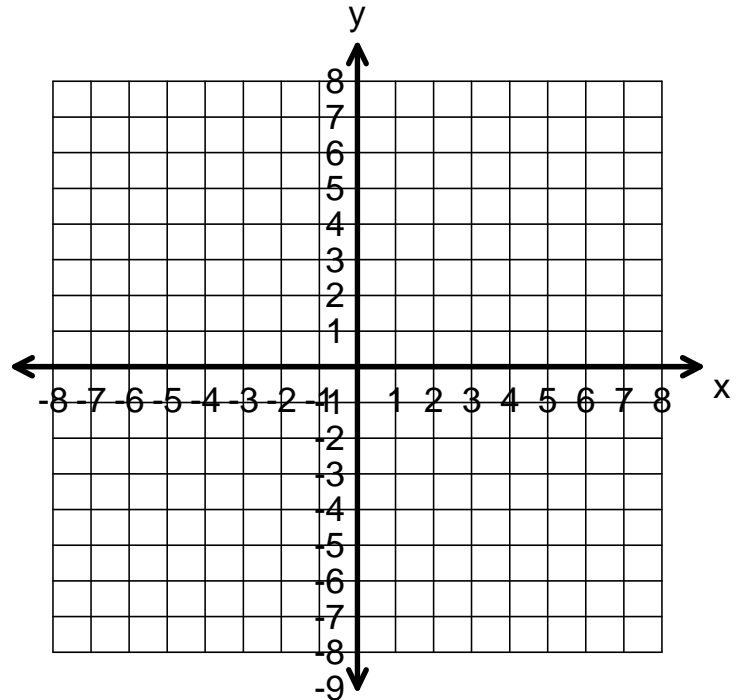
(A) $A(x) = (100 - x)x$　　　　(B) $A(x) = (100 - 2x)x$
(C) $A(x) = (50 - x)x$　　　　(D) $A(x) = (50 - 2x)x$

Part B: Show all workings to receive full credit.   [30 marks]

13. Given the function $y = -\dfrac{1}{2}(x+4)^2 + 6$ determine the following information and sketch the graph.   [7]

(A)   Axis of Symmetry equation: _____

(B)   Vertex: _____

(C)   Maximum or Minimum value is _____

(D)   Y–intercept:_____

(E)   Domain:_____

(F)   Range:_____

14.   An osprey dives toward the water to catch a salmon. Its initial height above the water is 30 feet.
It descends and at 2 seconds it catches a salmon when it is at a height of 1 foot. Determine the
quadratic function that models the flight path of the osprey.   [4]
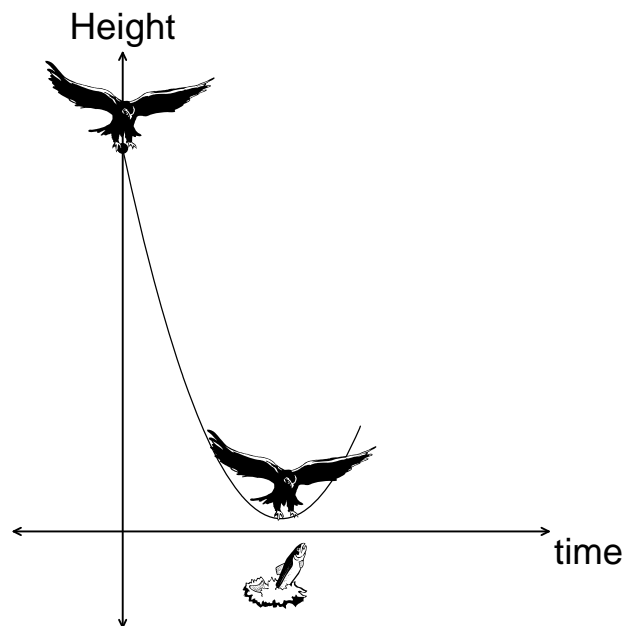
15. A ball is thrown into the air and its height h(t) above the ground, in meters, after t seconds is modeled by the function h(t) = $-6t^2 + 24t + 6$.

(A)   What is the initial height of the rocket?   [1]

(B)   What was the height of the ball at 3 seconds?   [2]

(C)   When did the ball reach its maximum height?   [2]

(D)   What was the maximum height of the ball?   [1]

16. Last year, QE charged a $10 session fee for photos and 400 sessions were booked. This year, the student council estimates that for every $1 increase in price, they expect to have 20 fewer sessions booked.

(A)   Write a quadratic function to model the maximum revenue for this situation.   [2]

(B)   Determine the maximum revenue.   [3]

(C)   What session fee will give the maximum revenue?   [1]

17. A rectangular region is to be constructed using 300m of fencing and a house as one side.

Wall of House   fencing
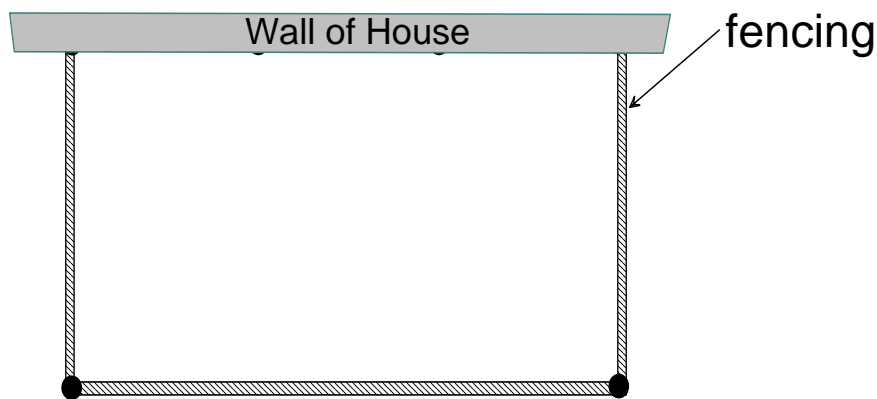
(A) Write the quadratic function that models the rectangular region.   [2

(B) Determine the width which maximizes the area.   [1]

(C) Determine the maximum enclosed area.   [2]