Math 2201 ***Chapter 6: SAMPLE TEST - Quadratic Functions*** **Name: Answer Key**

Part A: Multiple Choice. (13 marks) ____ / 27 = ____ %

a

Place the **letter** of the correct response in the space provided. Please use **CAPITAL** letters.

1. Which relation is quadratic? 1. **D**

   A) $y = -6x + 3$
   B) $y = (2x^2)(x + 1)$
   C) $y = x^3 - x^2 + 4x + 2$
   D) $y = (x + 5)^2$

2. What are the x-intercepts of $3(x-1)(x+2)=0$? 2. **C**

   A) x = -3, x = -2 and x = 1
   B) x = -2, x = 1 and x = 3
   C) x = -2 and x = 1
   D) x = -1 and x = 2

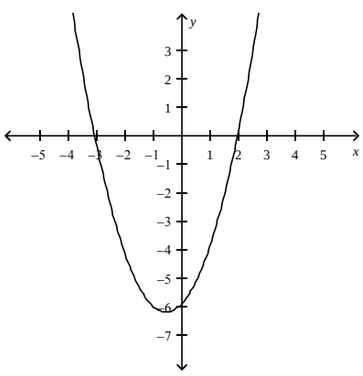
3. What is the y-intercept for $y = 3x^2 - 2x - 5$? 3. **A**

   A) $y = -5$
   B) $y = -2$
   C) $y = 3$
   D) $y = 5$

4. The points (–5, 6) and (3, 6) are located on the same parabola. What is the equation of the axis of symmetry for this parabola? 4. **B**

   A) $x = -2$
   B) $x = -1$
   C) $x = 0$
   D) $x = 4$

5. What is the correct quadratic function, in factored form, for this parabola? 5. **C**



   A) $f(x) = (x - 2)(x - 3)$
   B) $f(x) = (x + 2)(x - 3)$
   C) $f(x) = (x - 2)(x + 3)$
   D) $f(x) = (x + 2)(x + 3)$

6. What is the equation of the axis of symmetry of the function $y = -5(x-4)^2 + 3$? 6. **D**

   A) $x = -5$
   B) $x = -4$
   C) $x = 3$
   D) $x = 4$

7. What is the range of the function $y = 5(x+1)^2 - 4$? 7. **A**

   A) $y \geq -4$
   B) $y \leq -4$
   C) $y \geq 4$
   D) $y \leq 4$

8. What are the coordinates of the *y*-intercept of the function $y = -\frac{1}{2}(x-4)^2 + 5$? 8. **B**

A) (0, – 4)
B) (0, – 3)
C) (0, 5)
D) (0, 13)

9. How many *x*-intercepts does $f(x) = -3(x-2)^2 + 5$ have? 9. **C**

A) 0
B) 1
C) 2
D) 3

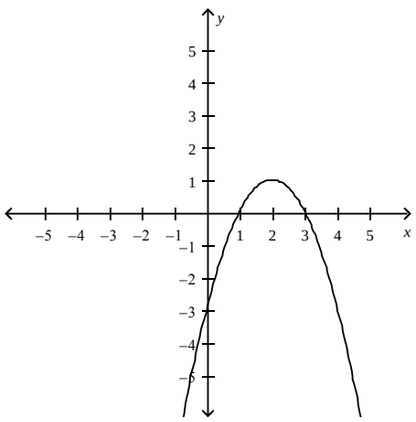
10. The height of a golf ball above the ground, *y*, in meters, is modeled by the function $y = -5x^2 + 20x$, where *x* is the time in seconds after the ball is hit. At what time, in seconds, does the ball reach its maximum height? 10. **B**

A) 1
B) 2
C) 3
D) 4

11. A theatre seats 400 people per show and is currently sold out with a ticket price of $10. A survey shows that for every $1 per ticket price increase, 25 fewer tickets will be sold. Which function models this situation? 11. **D**

A) $R = (400x - 25)(10 + x)$
B) $R = (400x - 25)(10 + 25x)$
C) $R = (400 - x)(10 + 25x)$
D) $R = (400 - 25x)(10 + x)$

12. What is the quadratic function, in vertex form, represented by the parabola? 12. **A**



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

13. Which equation represents the quadratic function $y = -2(x+1)(x-5)$ in standard form? 13. **D**

A) $y = -2x^2 + 4x + 8$
B) $y = -2x^2 + 12x - 10$
C) $y = -2x^2 + 8x - 12$
D) $y = -2x^2 + 8x + 10$

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Part B: Long Answer Questions. Show ALL workings to receive FULL credit. (14 marks)

1. Given the quadratic function $y = -2x^2 + 4x + 5$: ___ / 6

   a) What is the direction of opening?

   Opening is down…since "a" is negative

   b) Determine the y – intercept.

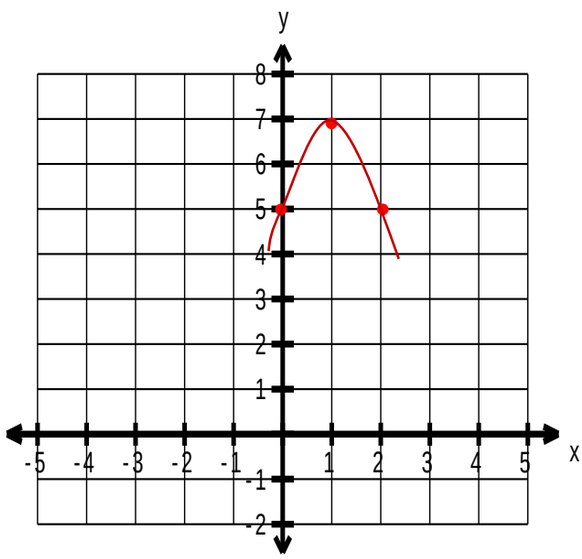
   (0,5)

   c) Determine the coordinates of the vertex.

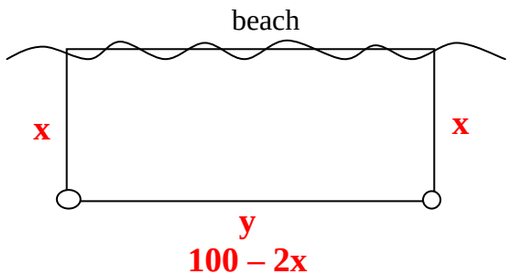
   (1,7)

   d) Sketch the graph.

   e) State the range.



2. A lifeguard marks off a rectangular swimming area using 100 m of rope. If he uses the beach as one side of the swimming area,
   a) algebraically determine the quadratic function that models the rectangular region.
   b) Use the function to determine the maximum swimming area.



100 – 2x

___ / 4

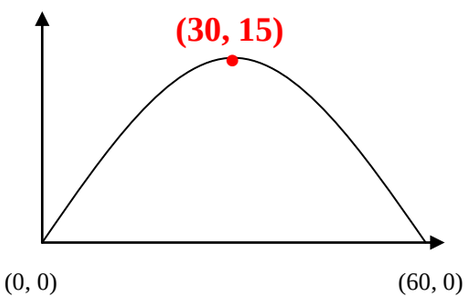
Perimeter = x + x + y
100 = 2x + y

a) $A = -2x^2 + 100x$

b) x = 25 m

Maximum Area = 1250 m^2

3. A soccer ball lying on the ground is kicked downfield and hits the ground 60 m away. The maximum height reached by the ball is 15 m.
   Algebraically determine the quadratic function that models the height of the ball.



___ / 4

In vertex form:	**In factored form:**	**In standard form:**
$y = -\frac{1}{60}(x-30)^2+15$	$y = -\frac{1}{60}x(x-60)$	$y = -\frac{1}{60}x^2+x$