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Mr. Kempe Date: _____

Practice Test #3 – Quadratics Part 2

[40 marks]

Part A: Multiple Choice [K/U, 10 marks]

Questions 1 – 5 use the quadratic relation $y=2(x+3)^2$.

1. What is the **vertex** of this relation?
   a. (2,3) b. (2, -3) c. (-3, 0) d. (3, 0)

2. What **direction** does this relation open?
   a. Up b. Down c. Left d. Right

3. What is the **step-pattern** of this relation?
   a. 1, 3, 5 b. 2, 6, 10 c. 3, 9, 15 d. -3, -9, -15

4. How many **zeroes** does this relation have?
   a. 0 b. 1 c. 2 d. 3

5. What is the ***y*-intercept** of this relation?
   a. 0 b. 6 c. 18 d. 36

6. What are the solution(s) to the equation $2x^2+8=0$?
   a. $x = 2$ b. $x = -2$ c. $x = \pm 2$ d. No solutions

7. **How many** solutions are there to the equation $y=3x^2-8x+2$?
   a. 0 b. 1 c. 2 d. 3

8. What are the solution(s) to the equation $(x-3)(2x+1)=0$?
   a. 3, -1 b. -3, 1 c. 3, -½ d. -3, ½

9. The height of a football thrown into the air is given by the equation $h=-5t^2+10t+2$, where h is the height in meters and t is the time in seconds. If you were asked to find the maximum height of the ball, you would need to find the…
   a. *y*-intercept b. Zeroes c. Vertex d. Step Pattern

10. The profit function for a coffee shop is given by the equation $P=-2n^2+12n-42$, where P is the profit in thousands of dollars, and n the number of customers, also in thousands. If you were asked to find the break-even point for this coffee shop, you would need to find the…
    a. *y*-intercept b. Zeroes c. Vertex d. Axis of Symmetry

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Part B: Definition / Short Answer

1. The vertex form is $y=a(x-h)^2+k$. Describe the role of *a*, *h*, and *k* in determining the shape/position of a parabola. [6 marks]

   a:

   h:

   k:

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2. Describe two ways you can get to **vertex form** from **standard form**. [2 marks]

3. Describe how the **discriminant** is used to determine the number of roots of a quadratic relation. [2 marks]

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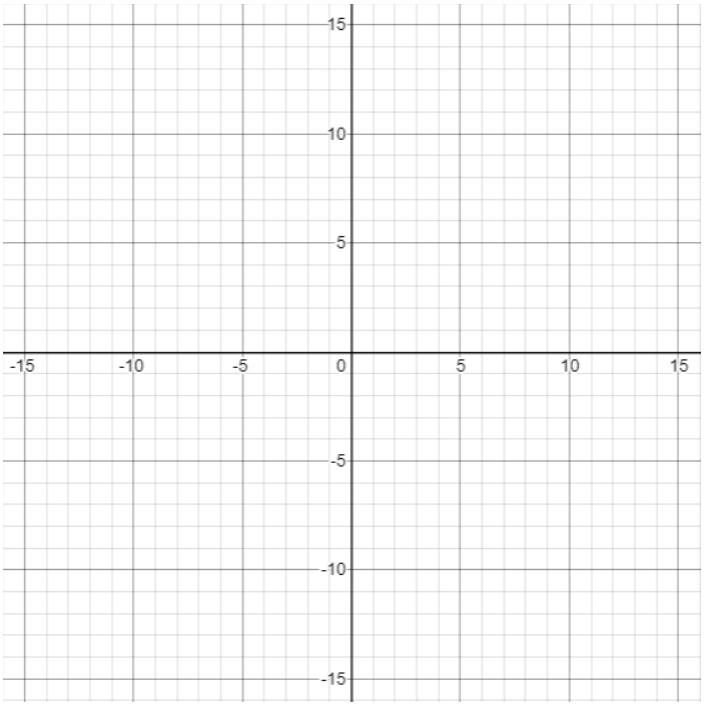
Part C: Problem Solving [ATIPS, 20 marks]

Complete any 5 of the following 6 problems. Each problem worth is 4 marks.

1. Sketch the graph of $y=-\frac{1}{2}(x-6)^2+8$ on the grid provided.
   Label the key features of the parabola.



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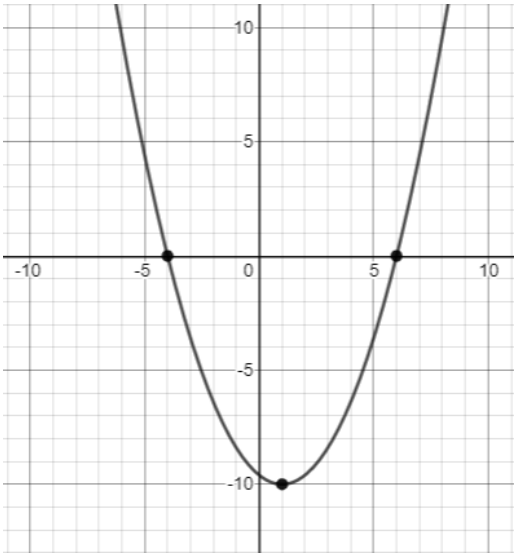
2. Determine the equation of the parabola shown in **vertex form**.



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3. Consider the quadratic relation $y = 5x^2 - 80x + 320$.

   a. Convert this relation to **vertex form**.

   b. Verify your work by converting your answer from (a) back to standard form.

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4. Determine the roots of $y=3x^2-17x+2$. Round your final answer to 2 decimal places.

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5. Tickets to a school dance cost $5, and the projected attendance is 300 people. For every $0.50 increase in the ticket price, the dance committee projects that attendance will decrease by 20. What ticket price will generate $1562.50 in revenue?

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6. Skydivers jump out of an airplane at an altitude of 3.5 km. The equation $H = 3500 - 5t^2$ models the altitude, *H*, in metres, of the skydivers at *t* seconds after jumping out of the airplane.
   a. How far have the skydivers fallen after 10 s?
   b. The skydivers open their parachutes at an altitude of 1000 m. How long did they free fall?