MPM 2D
Mr. Kempe

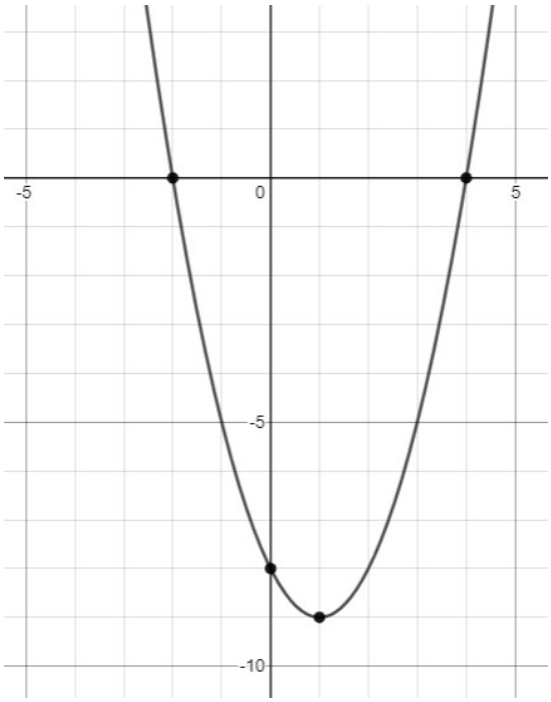
Name: _____
Date: _____

Test #3 – Quadratics Part 1

[40 marks]

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

Questions 1 – 5 use the graph of the parabola, shown right.



1. What is the **y-intercept** of the parabola?
   a. 4 b. -2
   c. -8 d. -9

2. What are the **zeroes** of the parabola?
   a. -2 and 4 b. 0 and -8
   c. -1 and -9 d. 2 and -4

3. What is the equation of the **axis of symmetry**?
   a. $x = 1$ b. $x = -4$
   c. $x = -5$ d. $x = -1$

4. What are the coordinates of the **vertex**?
   a. (-2, 4) b. (0, -8)
   c. (1, -9) d. (-9, 1)

5. The standard form of a quadratic is $y = ax^2 + bx + c$. What do you know about the value of a for this parabola by looking at the graph?
   a. a is positive b. a is negative c. a is 0 d. There is nothing known

Questions 6 – 8 use the relation $y=(x-3)(x+2)$.

6. What is the **y-intercept** of this relation?
   a. 0 b. 2 c. -3 d. -6

7. What are the **zeroes** of this relation?
   a. 3 and 2 b. -3 and 2 c. 3 and -2 d. -3 and -2

8. Which of the following is the **standard form** of the relation?
   a. $y=x^2-5x+6$ b. $y=x^2-x-6$ c. $y=x^2+x-6$ d. $y=x^2-x+6$

9. Which of the following is a **perfect square trinomial**?
   a. x^2+5x+6 b. $x^2-10x+25$ c. $x^2+13x+36$ d. x^2+49

10. Which of the following is **not a difference of squares**?
    a. x^2-49 b. $4x^2-9$ c. $25x^2-1$ d. $36x^2-25x$

MPM 2D Name: _____
Mr. Kempe Date: _____

Part B: Definition / Short Answer [C, 10 marks]

1. List four key features of parabolas can help you graph a quadratic relationship. [2 marks]

2. Referring to question 1, define **two** of the features you listed. [2 marks]

3. Explain how to read the **zeroes** from the **factored form** of a quadratic relationship. [2 marks]

MPM 2D Name: _____
Mr. Kempe Date: _____

4. Explain how to find the vertex of a quadratic relationship if you know already know the **zeroes**. [2 marks]

5. List the different types of factoring techniques we have learned, in *the order you should attempt them.* [2 marks]

MPM 2D
Mr. Kempe

Name: _____
Date: _____

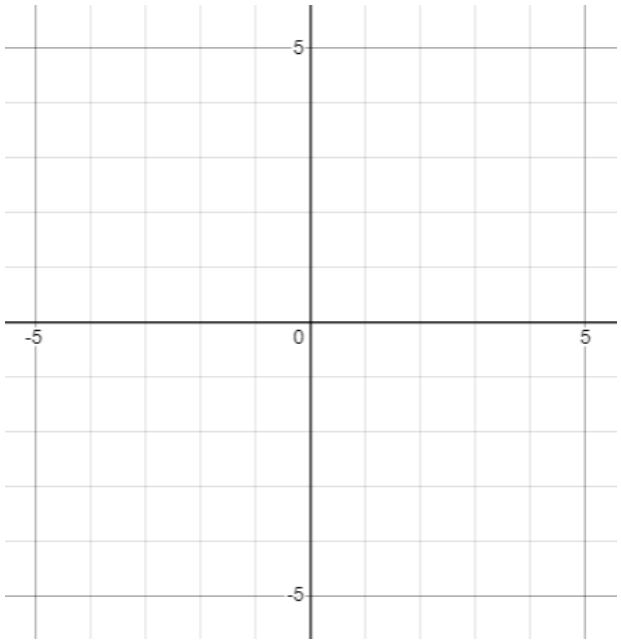
Part C: Problem Solving [ATIPS, 20 marks]

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

1. A quadratic relation has the equation $y=2(x+1)(x-2)$.

   Determine the *y*-intercept, zeroes, axis of symmetry, and vertex of this relation.

   Sketch the graph this relation and label the features.



MPM 2D Name: _____
Mr. Kempe Date: _____

2. A parabola has its vertex at (3,8). One of its zeroes is located at (1,0).

   a. What it the location of the other zero? [Hint: a rough sketch might help!]

   b. Determine the equation of the relation in **factored form**.

MPM 2D
Mr. Kempe

Name: _____
Date: _____

3. Expand and simplify.

a. $3x(x^2-4x+3)$

b. $(2x-5)(x+2)$

c. $(x-1)(x+1)-(x+9)(x-9)$

d. $(5x-3)^2$

MPM 2D
Mr. Kempe

Name: _____
Date: _____

4. Factor.

a. $x^2+8x+15$

b. $3x^2-8x+5$

c. $28x^2-63$

d. $x^3-8x^2-25x+200$

MPM 2D Name: _____
Mr. Kempe Date: _____

5. At a soccer game, a goalie kicks the ball down the field. The position of the ball is given by the relation $h=-\frac{1}{50}d(d-80)$, where h is the height above the ground and d is the distance from the goalie, both in meters.

   a. How far from the goalie does the ball land?

   b. What is the maximum height of the ball above the ground during the kick?

MPM 2D Name: _____
Mr. Kempe Date: _____

6. A hawk swoops down from a tree to catch a mouse. Its path can be modeled by the relation $h=3t^2-12t+12$ where t in the time in seconds, and h is the height in feet.

   a. How high above the ground is the hawk 1s after is begins its descent?

   b. How long does it take the hawk to reach the ground?