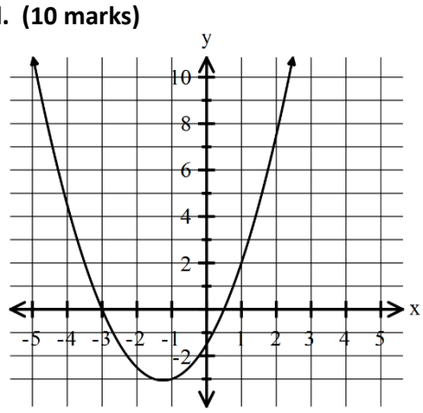
Math 2201 May 2020 Unit 7 – In-class Assignment Name:_____
(Total Marks =)

Part I: Place the letter of the correct answer in the space provided at the end. (10 marks)

1. For the graph, what are the roots of the quadratic function?



(A) $x = -3, x = -\frac{1}{2}$

(B) $x = -3, x = \frac{1}{2}$

(C) $x = 3, x = -\frac{1}{2}$

(D) $x = 3, x = \frac{1}{2}$

2. Which functions has zeros of – 3 and 7?

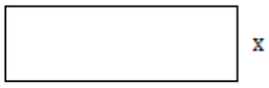
(A) $f(x) = (x - 3)(x - 7)$
(B) $f(x) = (x - 3)(x + 7)$
(C) $f(x) = (x + 3)(x - 7)$
(D) $f(x) = (x + 3)(x + 7)$

3. What are the roots of the quadratic equation $x^2 + 6x - 16 = 0$

(A) $x = -8, x = -2$
(B) $x = -8, x = 2$
(C) $x = 8, x = -2$
(D) $x = 8, x = 2$

4. A gardener has 120 m of fencing to mark off a rectangular vegetable garden. Which function could be used to determine the dimensions that will result in the maximum area?

(A) $A = x(x - 60)$
(B) $A = x(x - 120)$
(C) $A = x(60 - x)$
(D) $A = x(120 - x)$



5. A missile is fired from a ship into a quadratic trajectory that is modeled by the function

$$h(t) = -t^2 + 2t + 8$$

Where *h(t)* represents height in meters and *t* is time in seconds. Determine the time it takes for the missile to hit the water.

(A) 0.5 sec
(B) 2 sec
(C) 4 sec
(D) 8 sec

6. Yuko's steps for solving the quadratic equation using the quadratic formula are shown below. She incorrectly determines that the solutions are and, to the nearest hundredth. In which step did Yuko's first mistake occur?

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

STEP 1: $x = \dfrac{-5 \pm \sqrt{5^2 - 4(2)(-4)}}{2(2)}$

STEP 2: $x = \dfrac{-5 \pm \sqrt{25 + 32}}{4}$

STEP 3: $x = \dfrac{-5 \pm \sqrt{57}}{4}$

STEP 4: $x = 0.64, -3.14$

7. Which quadratic equation has a root of $x = -3$?

   (A) $x^2 - 3 = 0$
   (B) $x^2 + 3 = 0$
   (C) $x^2 - 9 = 0$
   (D) $x^2 + 9 = 0$

8. Which quadratic equation has no real solutions?

   (A) $x^2 - 9 = 0$
   (B) $x^2 + 4x + 3 = 0$
   (C) $x^2 - 3 = 0$
   (D) $x^2 + 4 = 0$

9. Solve: $3x^2 + 2x - 5 = 0$

   (A) $x = -\frac{5}{3}, x = -1$

   (B) $x = -\frac{5}{3}, x = 1$

   (C) $x = \frac{5}{3}, x = -1$

   (D) $x = \frac{5}{3}, x = 1$

10. Simplify: $x = \frac{8 \pm \sqrt{128}}{2}$

    (A) $x = -4, x = 12$
    (B) $x = 0, x = 16$
    (C) $x = 4 \pm 4\sqrt{2}$
    (D) $x = 4 \pm 8\sqrt{2}$

Part II: Show all workings in the space provided. (35 Marks)

1. Write each equation in standard form, then factor using graphing technology. Provide a rough sketch showing your solutions as x-intercepts. [8 Marks]

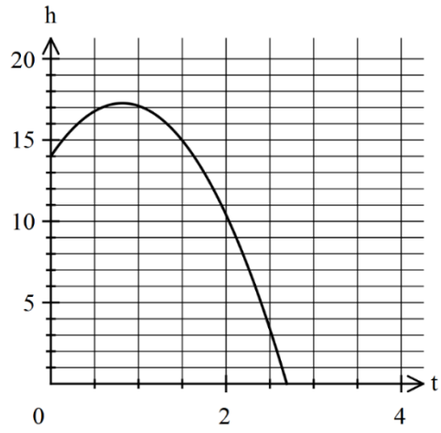
   (A) $2(x^2 - 6) = x^2 + x + 27$ (B) $x(x - 5) = (7)(2)$

2. A ball is thrown into the air from a bridge that is 14 m above a river. The function that models the height, *h(t)*, in meters, of the ball over time, *t*, in seconds show by the graph below. [8 Marks]

(A) When is the ball 12 m above the water?

(B) Is the ball never 18 m above the water? If not then what is the maximum height of the ball approximately?

(C) When does the ball hit the water?



3 Solve each quadratic equation by **factoring ONLY**. (20 marks)

$A)\ 2x^2-12x=0 \quad B)\ x^2-17x-60=0 \quad C)\ 4x^2-20x=24 \quad D)\ 2x^2-15x+28=0$

4 Solve by using the process of **<u>decomposition</u>** in factoring. Remember all quadratic equations must be put in standard form first.

$5x^2 = 21x + 20$

5. Solve the given equation. State the solution(s) in **exact** form by using the quadratic formula. [8 Marks]

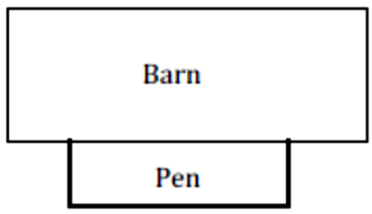
A) $2(3x^2) = -4x + 3$ B) $2(x-6) = 4x^2$

ALL APPLICATIONS MUST BE SOLVED BY USING THE QUADRATIC FORMULA

6. The sum of the squares of two consecutive **POSITIVE** integers is 365. Set up a quadratic equation and determine all possible sets of integers algebraically by using the quadratic formula. [8 Marks]

7. A farmer has 300 m of chain link fencing to create a rectangular pen, using the side of a barn as one side of the pen. If the total area is enclosed in the pen is 10,000m^2, set up a quadratic equation to describe the area and use it to find the dimensions of the pen algebraically.

[10 Marks]

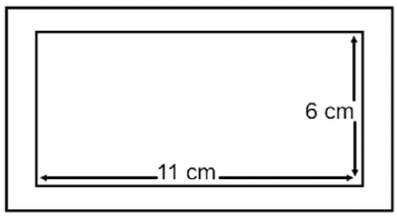


8. A ball is thrown from a building at an initial height of 11 m and is modeled by the function:

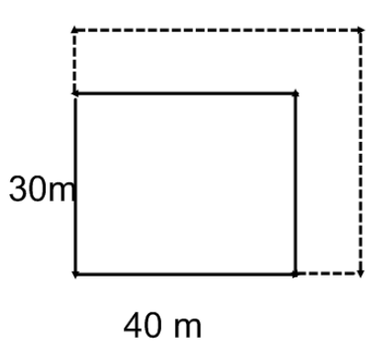
$$h(x) = -x^2 + 10x + 11$$

Where *h(x)*, represents the height of the ball, and *x*, represents the horizontal distance from the building. Three targets are placed at different locations on the ground. One is at (10, 0) another at (11, 0) and a final target at (12, 0). Which target does the ball hit? Show algebraically [6 Marks]

9. Your company is going to make specialty picture frames. The total area of the frame and photo together should be 150 cm^2. The photo inside of the frame has to be 11 cm by 6 cm. What should the width of the metal be? [8 Marks]



10. A rectangular parking lot has dimensions of 40 m by 30 m. The lot is to be enlarged by adding a strip of pavement of uniform width to its original width and length as shown below. After the strip is added, its new area is now 1824 m^2. Set up a quadratic equation to describe the new area and determine the width that was added on to the new parking lot. Find the roots to your quadratic equation by using the quadratic formula and determine the dimensions of the new parking lot.
12 marks



End Exam Date:_____