Math 20-2   **Name:_____**
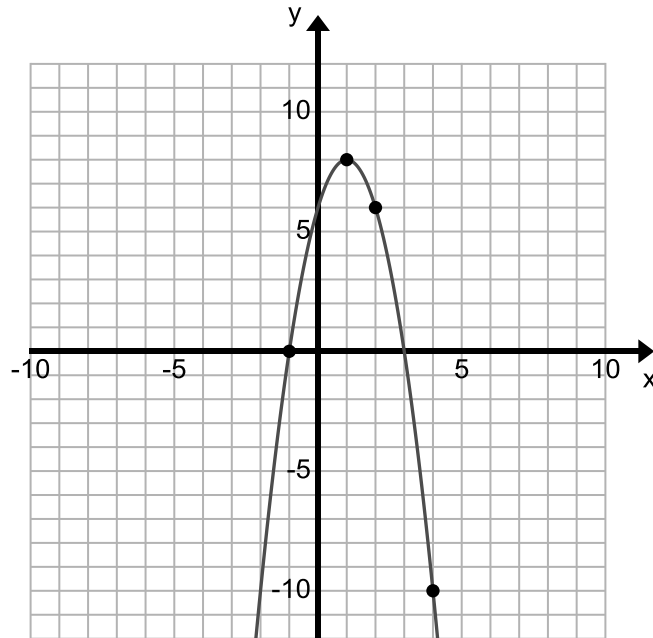
Quadratic Functions Quiz

1. Given the graph of the function:
    - Write the coordinates of the vertex.
    - Sketch in the axis of symmetry and write the equation for the axis of symmetry.
    - Find the x – intercepts.
    - Find the y – intercept.
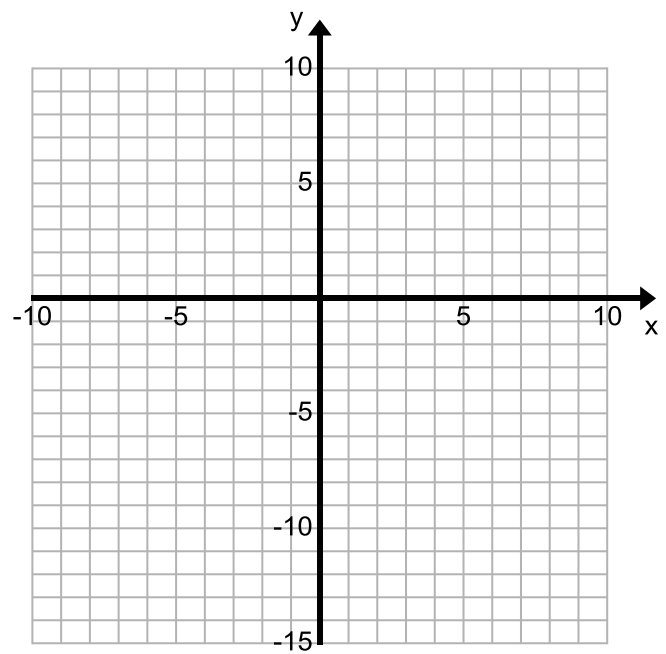   - Write the domain and range.

2. Given the equation of the quadratic function:
   - find points to plot using an algebraic method and/or a calculator skills
   - find the x – intercepts
   - find the y – intercept
   - find the vertex
   - write the equation for the axis of symmetry
   - write the domain and range

$$y = x^2 + 4x - 5$$

X	Y
-6	
-5	
-4	
-3	
-2	
-1	
0	
1	
2	

3. Use Quadratic Regression to find the quadratic equation and draw the graph for the following:

X	Y
-3	7
-2	0
2	-8
4	0
5	7

Identify the parameters:
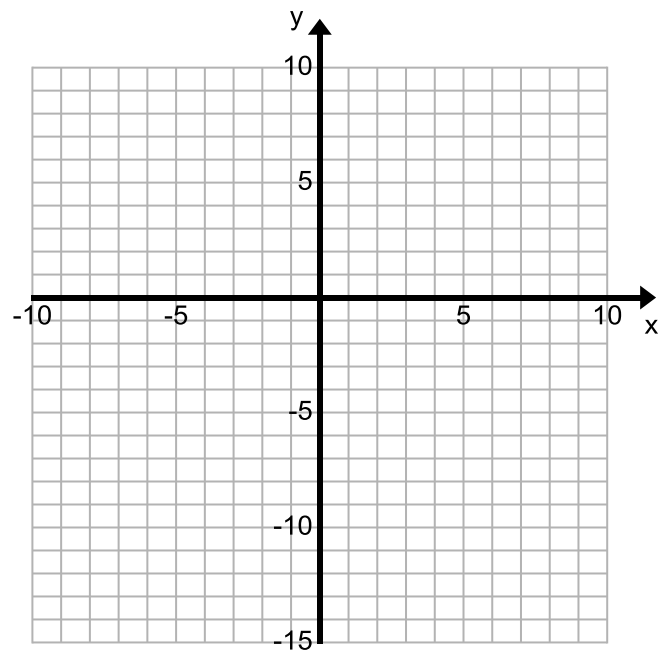
$$y = ax^2 + bx + c$$

$a =$

$b =$

$c =$

Write the equation:

4. A hockey arena has 3000 seats. When the price of a ticket is $20, all seats are sold for every game. The manager needs to increase the revenue from the sale of tickets, so she commissions a survey to predict ticket sales for different ticket prices. The results are shown in the table below.

Ticket Price	$ 20.00	$ 25.00	$ 55.00	$ 60.00	$ 75.00
Expected Sales	3000	2800	1600	1400	800

a) Find the revenue generated for each ticket price.

Ticket Price	$ 20.00	$ 25.00	$ 55.00	$ 60.00	$ 75.00
Revenue					

b) Determine a **quadratic regression** equation that could be used to best-fit the data. Round off your values to the nearest hundredth as necessary.
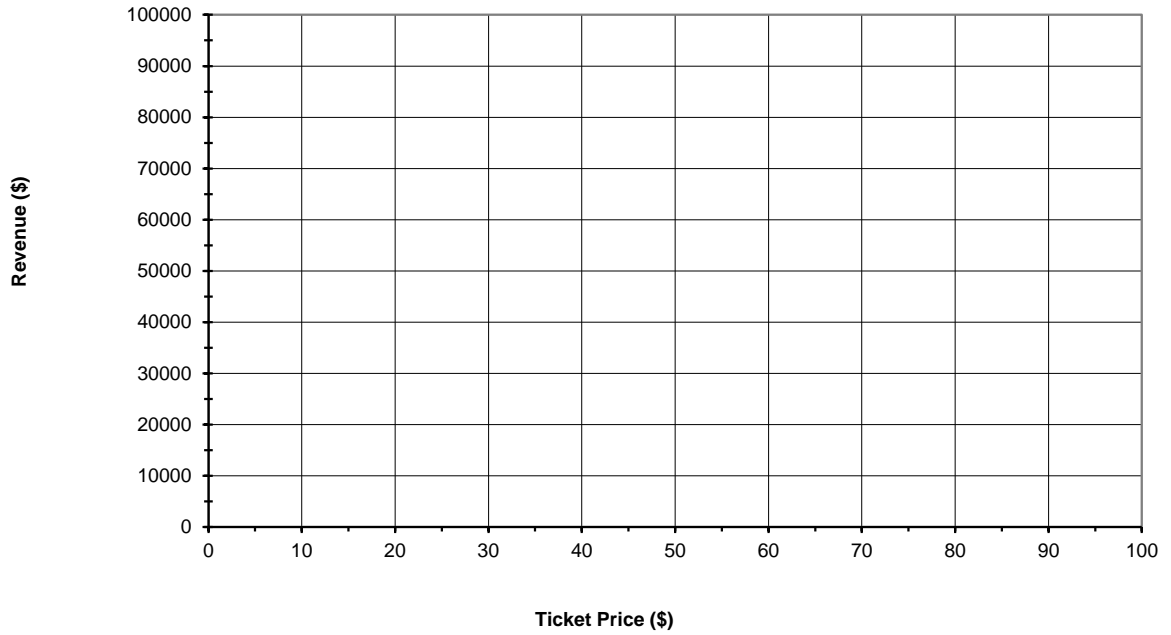
$y = ax^2 + bx + c$

$a =$

$b =$

$c =$

c) Use the scales on each axis to set a window for your calculator. Draw a graph to illustrate the expected revenue for different ticket prices.

Hockey Revenue

d) What ticket prices will generate revenue of $86000?

e) What ticket price will generate the maximum revenue?

5. A soccer player kicks the ball towards the goal. The height of the ball is given by the equation: $h = -0.3t^2 + 1.9t$, where t is the time in seconds and h is the height of the ball in metres.

a) Sketch the path of the ball using the window:

X: [-2,8,1]

Y:[-1,6,1]

b) Find the maximum height of the ball.

c) Find how long the ball is in the air.

e) Find when the ball first has a height of 2.0 metres.

6. At a fountain the path of water from one of the jets can be defined by the function: $f(x) = -0.25x^2 + 10x$.

   x = horizontal distance from the opening in the ground in feet

   f(x) = height of the spray water in feet.

   a) Find a window that will allow you to see the path of the water. (Quadrant one is where you want to see the water.)

   X:[min, max, scale] = [_____, _____, _____]

   Y:[min, max, scale] = [_____, _____, _____]

   b) Draw a sketch of the water path using your window.

   c) What is the maximum height of the arch of water?

   d) How far from the opening in the ground can the water reach?