

**YOU MAY USE A GRAPHING CALCULATOR FOR THE ENTIRE QUIZ!!!!**

1. Below, you are given three data sets. Analyze each data set and determine which data sets can be modeled using quadratic equations. Show your work/analysis or briefly explain how you determined your answer.

(a) Data Set #1

x	y
2	-14
3	-4
4	2
5	4
6	2
7	-4

Quadratic  
Not Quadratic  
**(2)**

(b) Data Set #2

x	y
-2	40
-1	29
0	20
1	13
2	8
3	5

Quadratic  
Not Quadratic  
**(2)**

(c) Data Set #3

x	y
0	3
1	8
2	15
3	24
4	33
5	42

Quadratic  
Not Quadratic  
**(2)**

2. A toy rocket is launched from a tower. As it flies through the air, its height, in meters, is related to its time in flight, measured in seconds. For this collected data set, enter the data into your TI-84 and then answer these questions.

Time (s)	0	1	2	3	4	5	6	7	8
Height (m)	16	49	57	85	88	81	64	37	6

- (a) You will graph the scatterplot on your TI-84. But in order to see the complete graph, what window settings will you use to see the scatterplot on your calculator?

Xmin =

Ymin =

Xmax =

Ymax =

**(2)**

- (b) Show me your scatterplot on the calculator to get marks for your scatter plot

**(4)**

- (c) Use QUADREG to determine the equation for this data set. Write the equation here.

**(2)**

3. Here is a graph of a quadratic relation. Answer the following analysis questions.

**(8)**

(a) State the coordinates of the zeroes of the parabola.

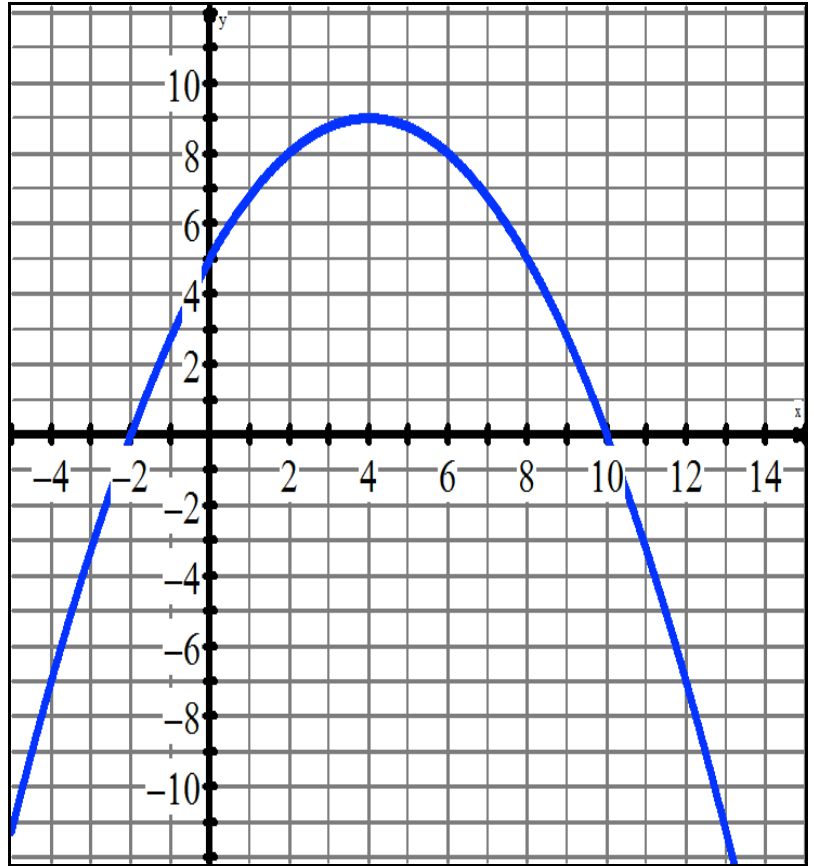
(b) State the coordinates of the y-intercept.

(c) State the equation of the axis of symmetry.

(d) State the optimum value.

(e) Determine the value of  $y$  when  $x = 8$ .

(f) Determine the value(s) of  $x$  when  $y = -3$ .



4. In this question, you will use graphing calculator to help you answer these questions about various features of the graphs of parabolas. If you wish to, you may use alternative, algebra based strategies to help you answer the questions

a. Determine the vertex of the parabola  $y = 2x^2 + 5x - 8$

**(2)**

b. Determine the equation of the axis of symmetry of the parabola  $y = 3(x + 4)(x - 7)$

**(2)**

c. Find the zeroes of the parabola  $y = -0.5x^2 + 2x + 5$

**(2)**

5. The zeroes of a parabola are at  $x = 3$  and  $x = 10$  and the  $y$ -intercept is at  $-15$ .

a. What is the equation of the axis of symmetry of this parabola? Show work OR explain how you determine the equation

(2)

d. Sketch the parabola here, labeling the zeroes, the  $y$ -intercept and the axis of symmetry and the vertex.

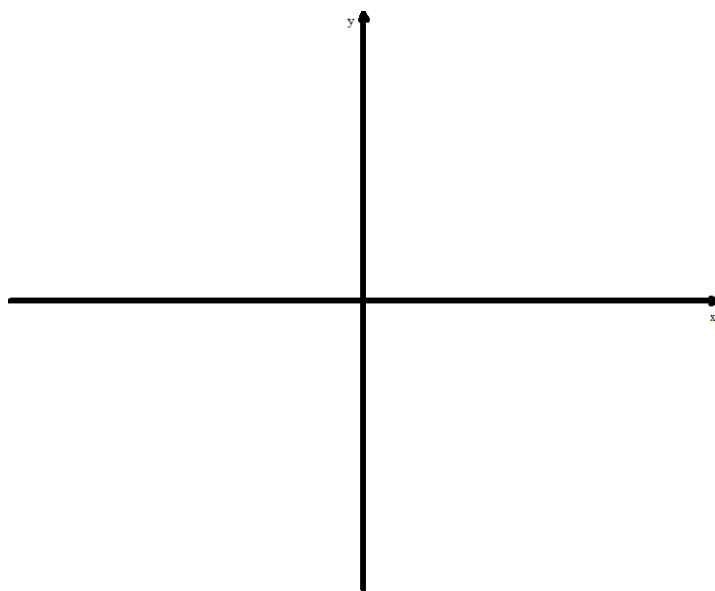
(5)

b. Determine the equation of this quadratic relation. Show work OR explain how you determine the equation.

(2)

c. Determine the optimum value. Show work OR explain how you determine the equation.

(2)



6. A company called SAMSOONG introduces a new cellphone (called the MATH Quad X PHONE) and its PROFITS are modelled by the equation  $P = -5m^2 + 80m - 100$ , where  $m$  is time in months (we will use  $m = 0$  to represent January) and  $P$  is the profit in millions of dollars (so that the ordered pair  $(10,200)$  means that in the month of November, the profit was \$200,000,000). The cellphone is sold for a period of 2 years.

- a. Graph the profit function on your TI-84.  
What window settings did you use?

Xmin =

Ymin =

(2)

Xmax =

Ymax =

(2)

- b. Calculate the zeroes of the quadratic and interpret what they mean.

- c. Calculate the co-ordinates of the vertex and interpret.

(2)

- d. Evaluate  $P$  when  $m = 5$  and interpret what your answer means in the context of this problem.

(2)

- e. Solve for  $m$  when  $P = -25$  and interpret what your answer means in the context of this problem.

(2)

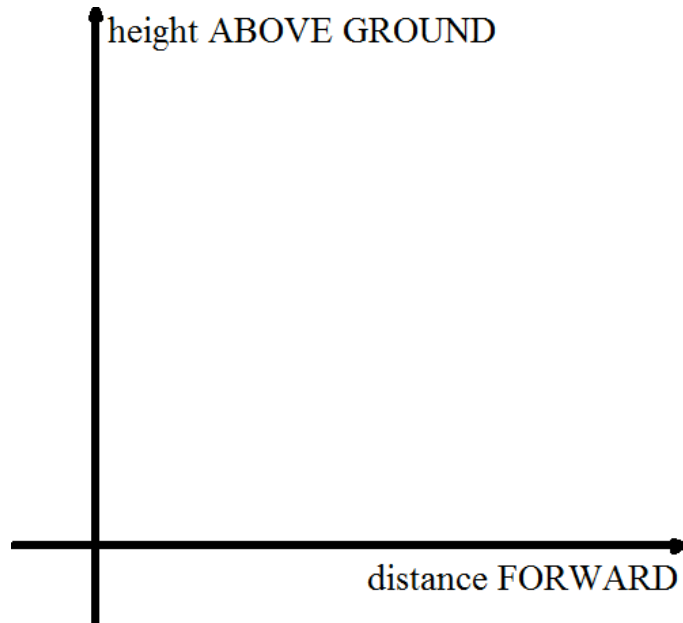
- f. This company needs a new Chief Financial Officer, who needs to decide when SAMSOONG should STOP making and selling this model (MATH Quad X PHONE). When should they stop? Explain your reasoning/thinking in this decision.

(2)

7. Mr. Santowski was helping to coach basketball this year and been TRYING to help Hannah learn how to make a basketball shot! In one practice, Mr Santowski recorded the following details about Hannah's shot as she was trying to make a free throw:

- Hannah released the ball from a height of 1.75 meters above the ground
- after it traveled 2.5 meters forward, the ball reached a maximum height of 4 meters above the ground
- after the ball traveled 4 meters forward, it reached a height of 3.19 above the ground.

We will define  $x$  to represent the distance the ball travels FORWARD and we will define  $y$  as the height of the ball ABOVE THE GROUND, as per the diagram to the right.



(a) List the three ordered pairs that correspond to the details that Mr S recorded about Hannah's throw.

(2)

(c) Use your calculator to determine the quadratic equation that models the flight to this basketball shot. Write your equation here.

(b) Draw a picture of the scenario, labelling the three points Mr S. has recorded in his data set.

(2)

(2)

The basket is located at a location given by the coordinates of  $(4.57, 3.05)$

(d) Explain what the coordinates of  $(4.57, 3.05)$  mean in the context of this problem.

(2)

(e) Does her shot make it into the basket? Explain the reasoning to your answer.

(2)