MFM 2P Mrs. Roen Name: _____

Course: MFM2P Gr. 10 Applied **Lesson: 6-2**

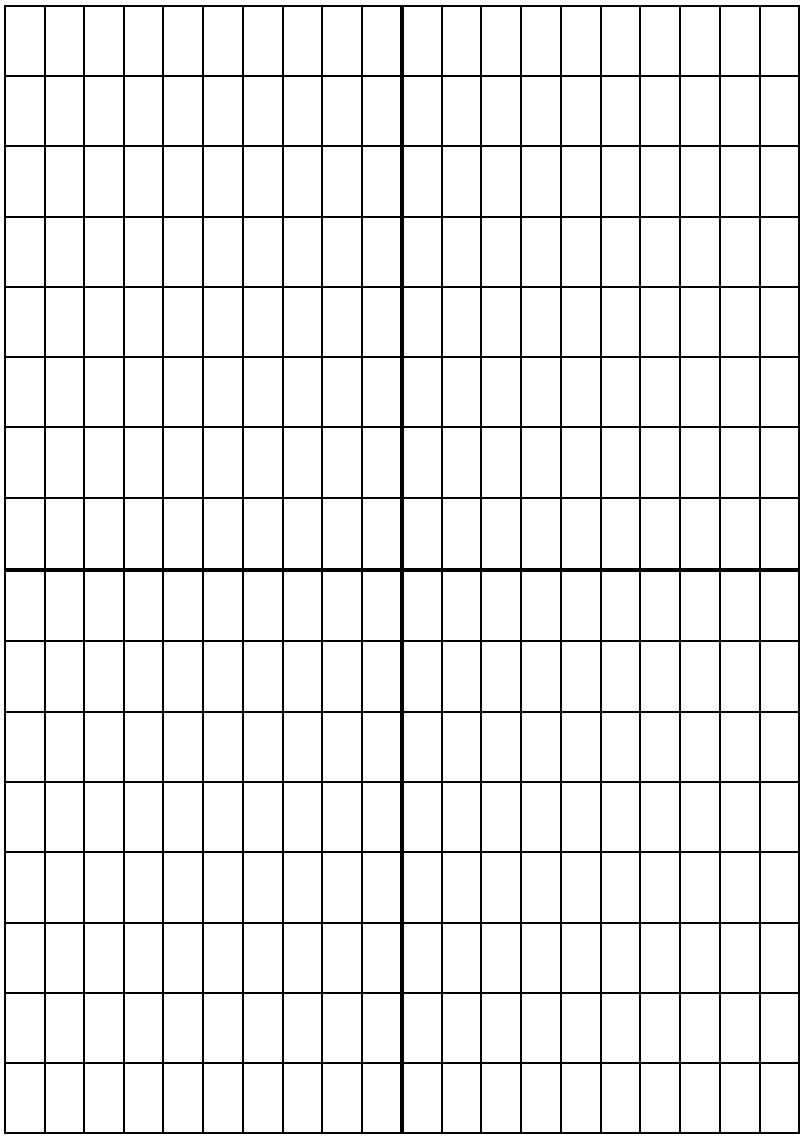
Unit: Quadratic Relations **Topic: Exploring Non-Linear Relations**

- ***homework check:*** **Lesson 6 - 1**

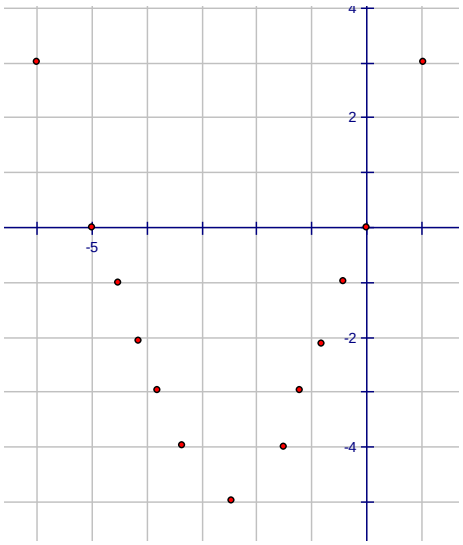
- ***note:*** **Exploring Non-Linear Relations**

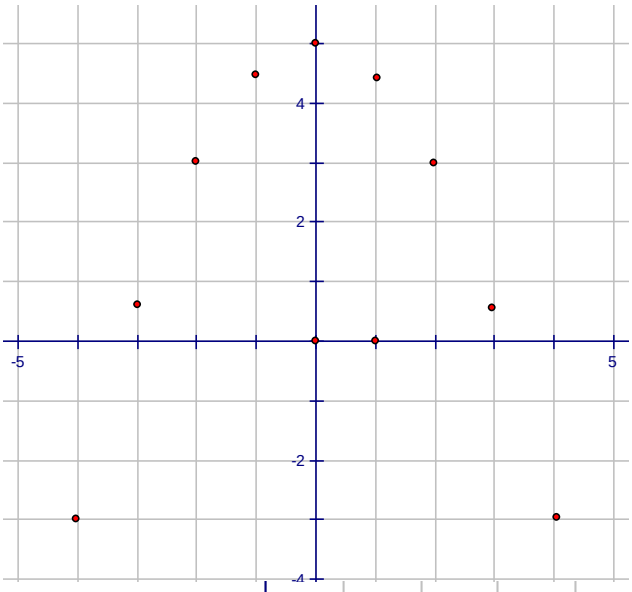
Relations that do not form one single straight line are non-linear. A quadratic relation is one type of non-linear relation. The graph of a quadratic relation is called a parabola. Parabolas are symmetric much like the geometric shapes we saw in our prerequisite skills. For example, construct a table of values between x = -1 and x = 5 for the relation $y = (x-2)^2 - 9$ then draw a smooth curve that joins the points.

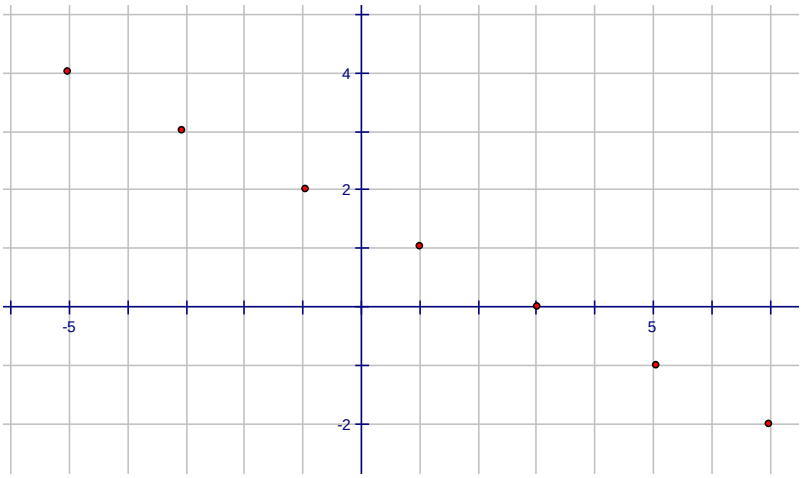
x	y
-1	0
0	-5
1	-8
2	-9
3	-8
4	-5
5	0

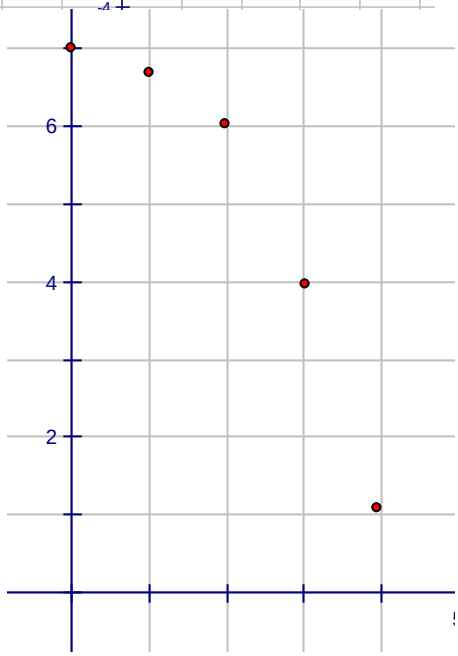


The shape of this specific curve is called a parabola. There are several different types of curves, but in grade 10 math, we only need to know whether the relation is linear or non-linear and whether the curve is quadratic or not. We also need to concern ourselves with whether to draw a line or curve of best fit. For example, draw a line or curve of best fit for each of the following.









We can use the line or curve of best fit to interpolate and answer questions if asked. For example, from graph number one, what is the value of x when y is 1.5?

If we go up the y scale to y=1.5, across to the curve and down to the x axis, we read the value of x is approximately 0.5.

- ***homework assignment:*** **<u>Lesson 6 - 2</u>**

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Lesson 6 – 2: Exploring Non-Linear Relations **Mark (/39): _____**

1. Graph each set of data on the grid provided. Draw a line OR curve of best fit. (4 marks each)

a)

x	3	4	5	6	7
y	12	7	4	3	4

b)

x	0	1	2	3	4	5
y	8	6	4	2	0	-2

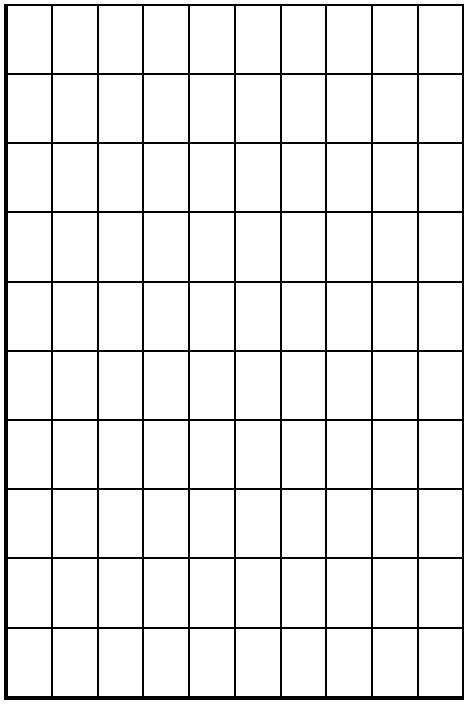
2. Copy and complete the table given the pattern diagram. Draw a graph with a line or curve of best fit. (5 marks)

Side Length (units)	Area (square units)
1	
2	
3	
4	
5	

3. a) Complete the table.
b) Draw a graph comparing the base and perimeter. Draw a line or curve of best fit.
c) Draw a graph comparing the base and area on the same grid. Draw a line or curve of best fit.

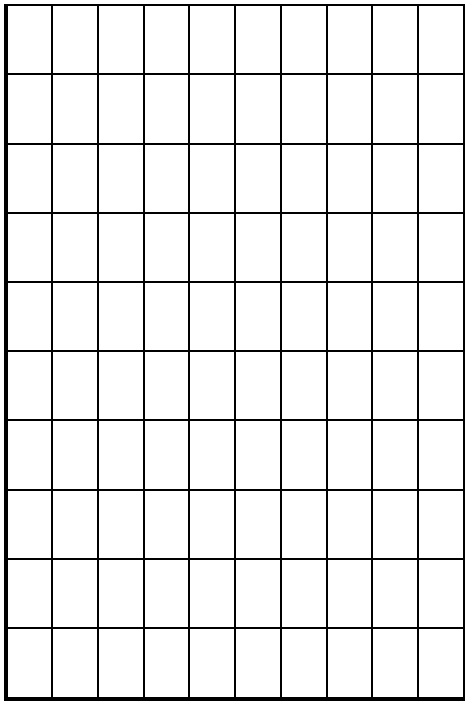
(8 marks)

Base	Height	Perimeter	Area
1	1	4	1
2	2	8	4
3	3	12	9
4	4		
5	5		
6	6		



4. Complete the chart for the diagram given. Draw a scatter plot representing the relationship between Length and Area. (6 marks)

Length (cm)	Width (cm)	Area (cm^2)
1	2	2
2	4	8
3	6	18
4		
5		
6		
7		
8		



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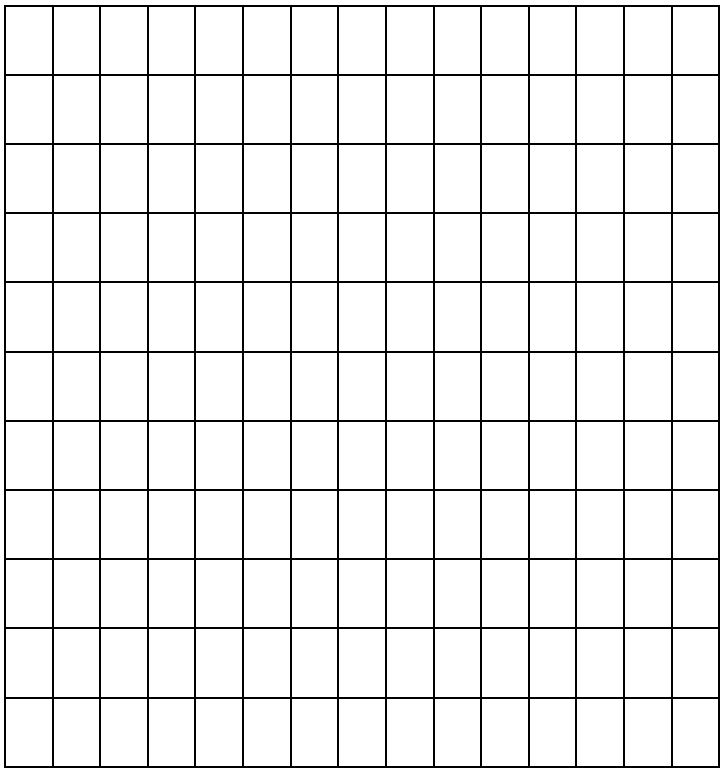
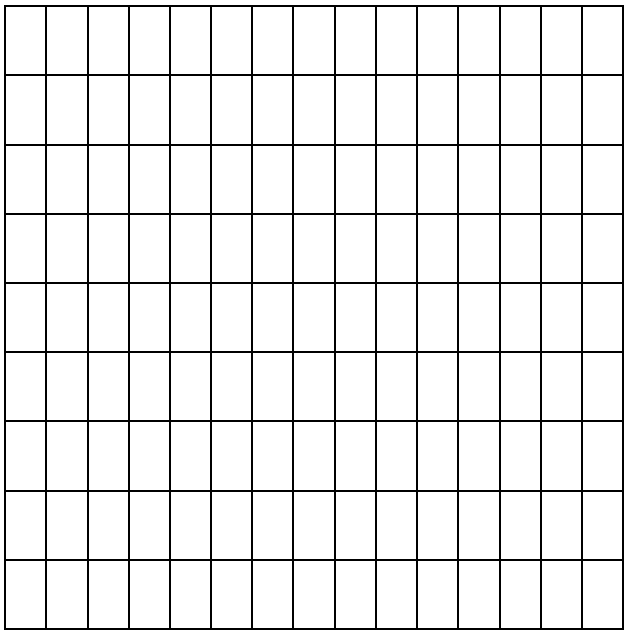
5. Sandy has 50 m of edging to create her garden. Complete the table below. Draw a graph of the length and area. Draw a line or curve of best fit. (6 marks)

Length (m)	Width (m)	Area (m^2)
1	24	24
2	23	46
3	22	
4	21	



6. a) Given the data, graph and draw a line or curve of best fit. (4 marks)

Length (cm)	Times (s)
0	0
20	0.90
40	1.27
60	1.55
80	1.80
100	2.00
120	2.20



b) Use your graph to predict the times: (2 marks)

90 cm: **50 cm:**