DAY 1 – Modelling Quadratic Relations

1. Use the mathematical models to determine whether the relation is linear, quadratic or neither (circle the appropriate answer). Give a reason for each answer.

a.

$$y = 9x^2 + 6x - 7$$

linear or *quadratic* or *neither*?

Reason: _____

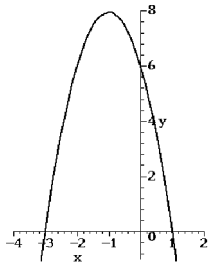
b.

x	*y*	1st	2nd
4	5		
2	2		
0	1		
-2	4		
-4	7		

linear or *quadratic* or *neither*?

Reason: _____

c.



linear or *quadratic* or *neither*?

Reason: _____

d.

$$y = 6x$$

linear or *quadratic* or *neither*?

Reason: _____

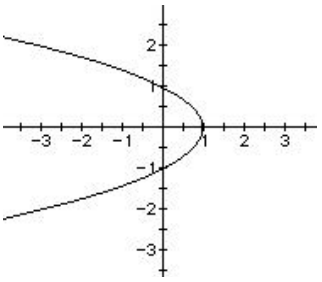
e.

x	*y*	1st	2nd
2	12		
1	3		
0	0		
-1	3		
-2	12		

linear or *quadratic* or *neither*?

Reason: _____

f.



linear or *quadratic* or *neither*?

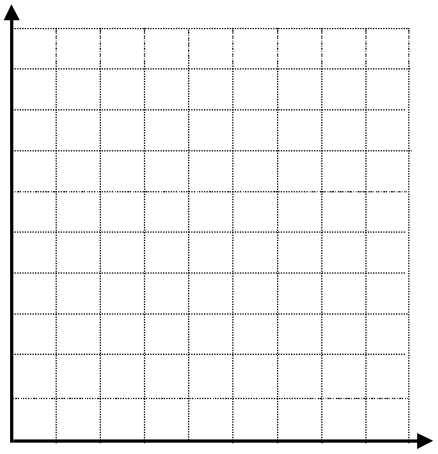
Reason: _____

2. Last year a clothing boutique sold 1200 t-shirts for $10 each. Market research suggests that for every $5 increase in price, 200 fewer t-shirts will be sold.

   a. Complete the table until the price is $40 in the table below.

   b. Graph the data below. Plot *Price* against *Income*. Label axes and give graph a title.

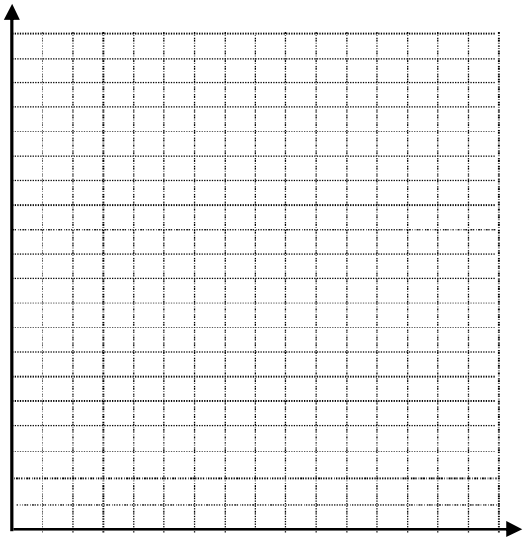
Price	Number of T-shirts Sold	Income
$10	1200	$12 000
$15	1000	
$20		
$25		
$30		
$35		
$40		



   c. Which price results in the maximum income? _____

3. A cannonball is shot horizontally from the top of a cliff. Its path can be modelled by the relation , where *h* is the cannonball's height above the ground, in metres, and *t* is the time, in seconds.
   a. Complete the table below.

time	$h = 150 - 5t^2$	*height*	1st	2nd
0				
1				
2				
3				
4				
5				



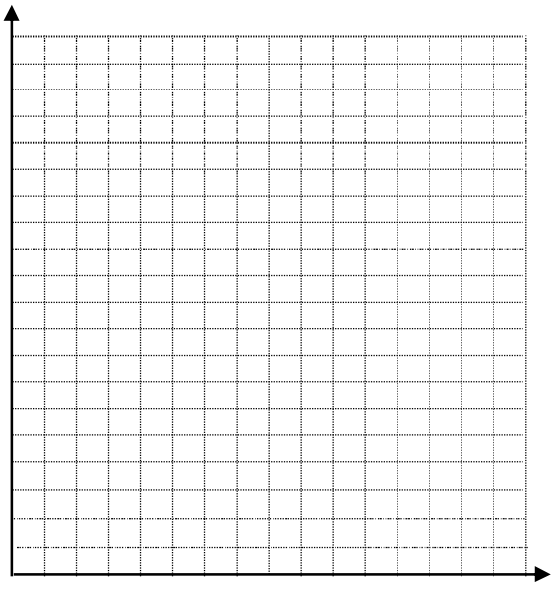
   b. Is the relation quadratic? How do you know?

   _____

   c. Graph the relation in the grid above. Label axes and give graph a title.

4. A craft store sold 800 ornaments for $2 each. A survey suggests that every $1 increase in price will reduce sales by 100.
   a. Complete the table below until no ornaments are sold.
   b. Graph the data Price versus Income. Label axes and give graph a title.

Price	Number of Ornaments Sold	Income



   c. Which price results in the maximum income? _____