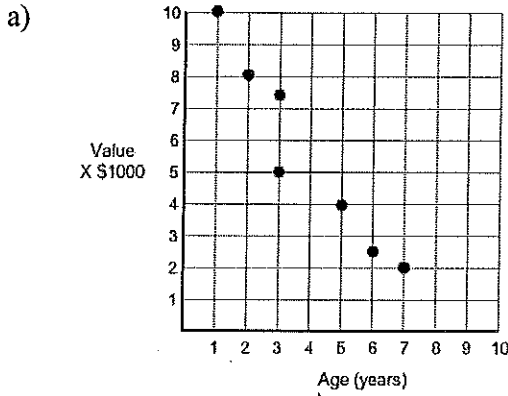


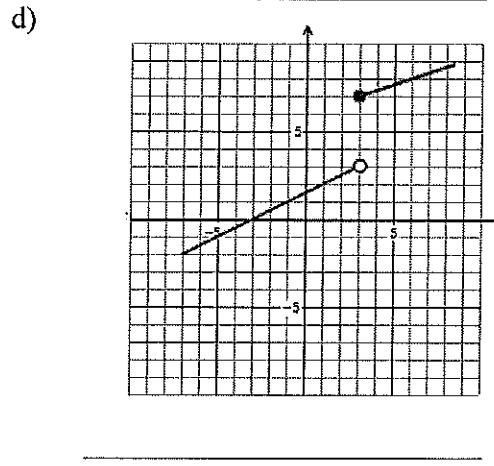
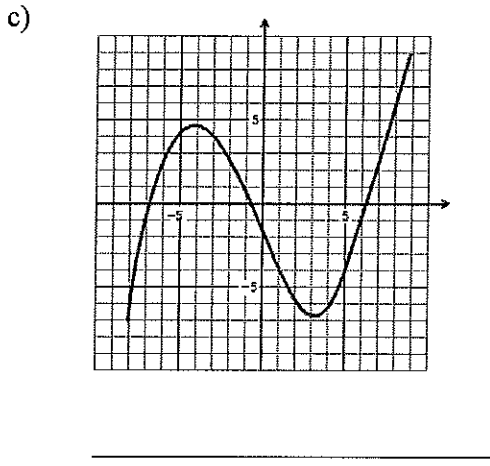
**PART A: Functions, their Graphs, Domain and Range**

1) For each relation shown below, label each as a function or not a function. (1 mark each)

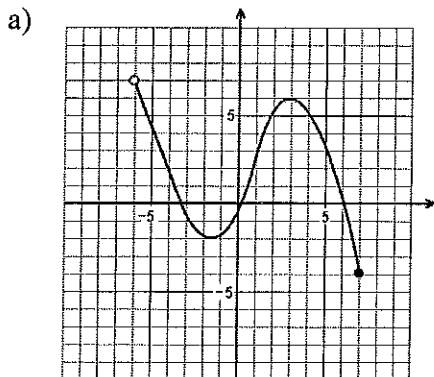


b)

<i>Donuts</i>	<i>Cost</i>
1	0.50
2	1.00
3	1.50
4	2.00
5	2.50
6	3.00



2) Indicate whether each of the following is a function or not, and state the domain and range for each. (3 marks each)



Is it a function? \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Email: \_\_\_\_\_

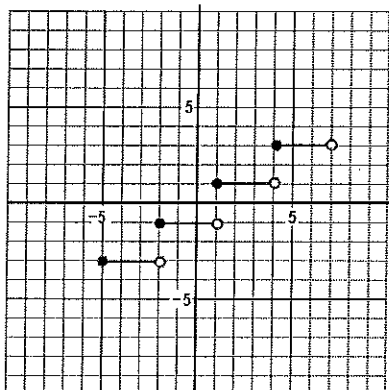
b)  $y = \sqrt{x+4}$

Is it a function? \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

c)



Is it a function? \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

d)  $x = y^2 - 2$

Is it a function? \_\_\_\_\_

Domain: \_\_\_\_\_

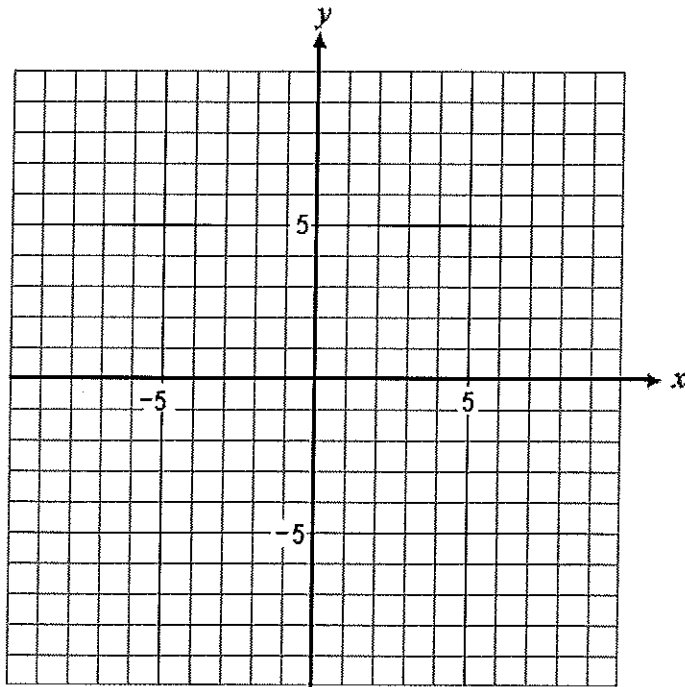
Range: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Email: \_\_\_\_\_

4) Sketch this relation.  $y = \frac{1}{x+3} - 1$  (5 marks)



Is it a function? \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

**PART B: Translating Graphs of Functions**

**Objectives:** When you complete this lesson, you will be able to:

- Describe how a translation affects the graph and other properties of a specific or a general function or relation.
- Sketch a translated function or relation
- State the transformation that produced a sketch from a given sketch.

You will need to visit a number of websites to ensure that you are comfortable and confident in your knowledge of the material required for Part B of this assignment. Watch each of the following videos or go through the lesson presented on the site before attempting the questions in assignment part B. Most of the videos only take about 5 minutes to complete. If you keep this

Review of the basic functions you should know from Pre-Calculus Math 11. Go through this first to refresh your memory on what the basic graphs of the various functions look like.

<http://bcmath.ca/m10h/m10hch5/m10hc51/index.html>

Applets which demonstrate horizontal and vertical translations on various functions. Read the information presented on the left side of the page and then use the applets on the right side, click on a specific function, to demonstrate how changes affect the graph. The equation of the new function is shown above the graph.

<http://staff.argyll.epsb.ca/jreed/math30p/transformations/translations.htm>

Translations of quadratic functions.

<http://www.youtube.com/watch?feature=endscreen&NR=1&v=9DIIOAYYIAw>

Translations of cubic functions

<http://www.youtube.com/watch?v=Vh8fSL6QypE&feature=relmfu>

Translations of reciprocal functions

[http://www.youtube.com/watch?v=tlmHYFFY4MI&feature=results\\_video&playnext=1&list=PLC6473082A461BB1A](http://www.youtube.com/watch?v=tlmHYFFY4MI&feature=results_video&playnext=1&list=PLC6473082A461BB1A)

Translating functions which have already been translated. This demonstrates how the equation and graph of a function which already has been translated will change when another translation is applied.

<http://www.youtube.com/watch?NR=1&feature=endscreen&v=zEQrRC2uNcw>

<http://www.youtube.com/watch?v=zYF3MCdI6S0>

<http://www.dummies.com/how-to/content/how-to-translate-a-functions-graph.html>

The translations that you have covered in these lessons apply not only to the functions that you have dealt with in the lessons, but also to any other functions you may be presented with. Feel free to use any other sites you might find to supply additional material.

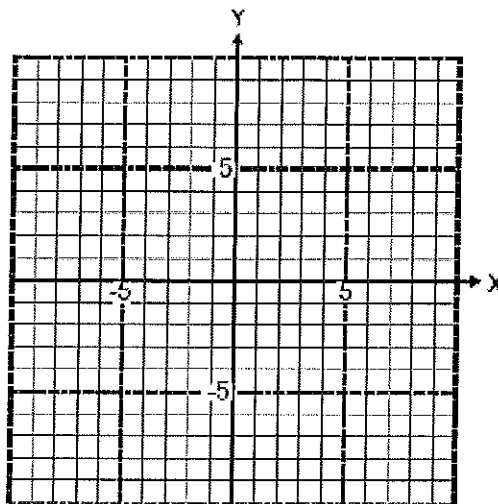
**Once you are comfortable and confident in your knowledge, complete Part B of the assignment.**

**PART B: Assignment for Translating Graphs of Functions****NOTE: 30 marks total, marks as indicated.**

1. What happens to the graph of the function  $y = f(x)$  if you make the following changes to its equation. (3 marks)
- Replace  $x$  with  $x - 5$  \_\_\_\_\_
  - Replace  $y$  with  $y + 2$  \_\_\_\_\_
  - Replace  $x$  with  $x + 3$  and  $y$  with  $y - 7$   
\_\_\_\_\_
2. Write the equation of the  $y = f(x)$  after each transformation. (3 marks)
- A transformation of 4 units right \_\_\_\_\_
  - A transformation of 6 units up \_\_\_\_\_
  - A transformation of 1 unit left and 2 units down \_\_\_\_\_
3. The function  $y = f(x)$  is transformed to  $y = f(x - c) + d$ . Determine the value of  $c$  and  $d$  for each transformation. (3 marks)
- |                                   |             |             |
|-----------------------------------|-------------|-------------|
| a. 8 units up                     | $c =$ _____ | $d =$ _____ |
| b. 2 units left                   | $c =$ _____ | $d =$ _____ |
| c. 4 units down and 7 units right | $c =$ _____ | $d =$ _____ |

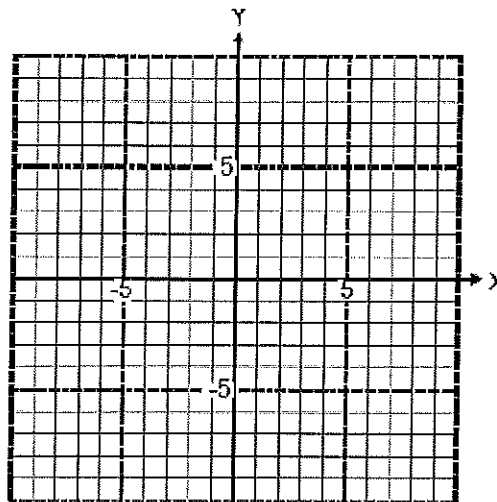
4. Sketch the graphs of the following functions on the grid below. (3 marks)

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



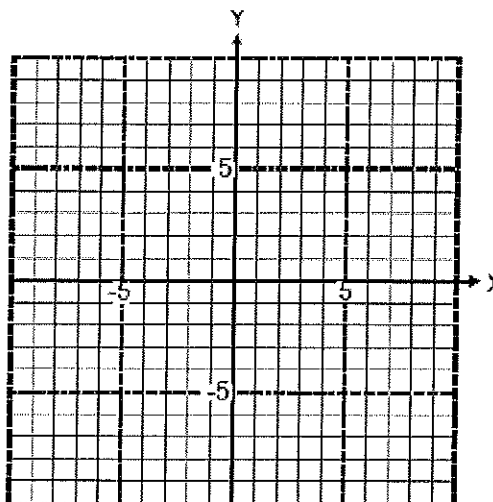
5. Sketch the graphs of the following functions on the grid. (3 marks)

- $y = \frac{1}{x}$
- $y = \frac{1}{x-5}$
- $y = \frac{1}{x+2} + 3$



6. Sketch the graphs of the following functions on the grid. (3 marks)

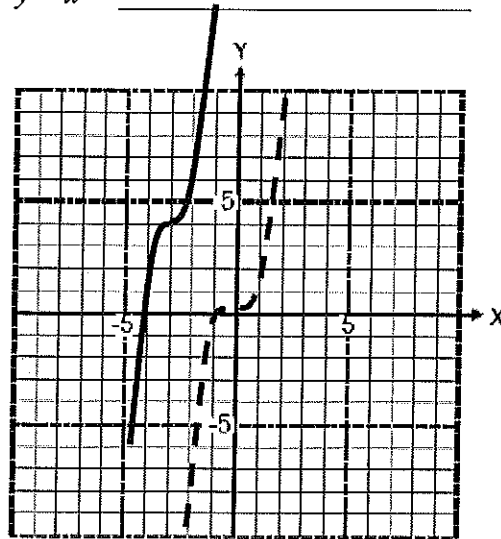
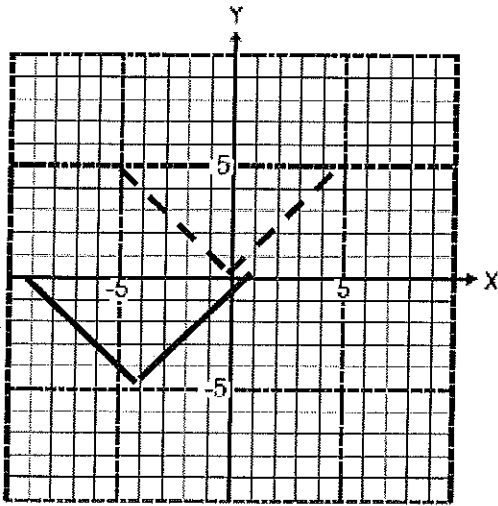
- $y = \sqrt{9-x^2}$
- $y = \sqrt{9-(x-4)^2}$
- $y = \sqrt{9-(x+3)^2} - 2$



7. The function given above the graph is represented by the dotted curve. Write an equation of the function represented by the solid curve. (2 marks each)

a.  $y = |x|$  \_\_\_\_\_

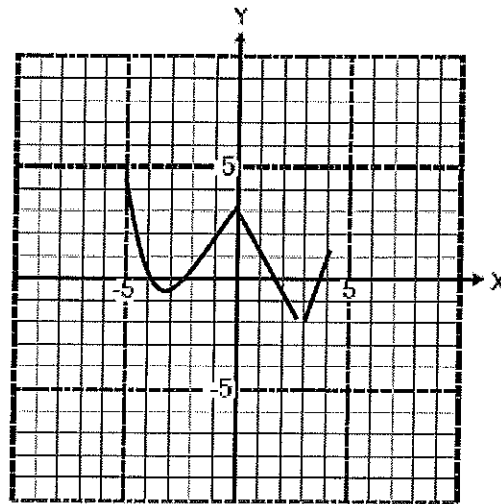
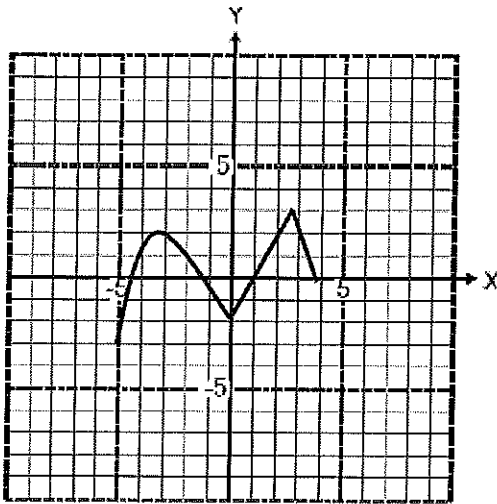
b.  $y = x^3$  \_\_\_\_\_



8. The line is the graph of  $y = f(x)$ , sketch the graph of the new function.. (2 marks each)

a.  $y = f(x - 5)$

b.  $y - 3 = f(x)$



c.  $y = f(x + 4) - 2$

d.  $y + 1 = f(x - 2)$

