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**WORKSHEET 9**

School: Ba Sangam College  
 Subject: Mathematics

Year / Level: 12  
 Name of Student: \_\_\_\_\_

<b>Strand</b>	3 – Graphs
<b>Sub strand</b>	3.1 – Graphs and Intersections
<b>Content Learning Outcome</b>	➤ Studying and interpreting graphs

**Review of Transformation of Quadratic Graphs (Ref: Year 12 Mathematics Pg 95 – 98)**


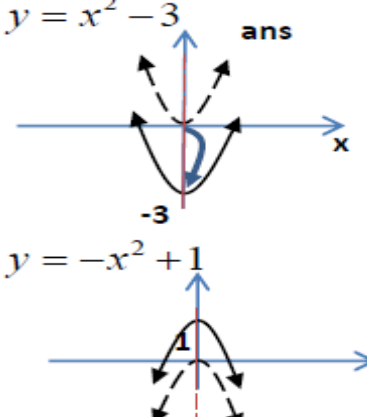
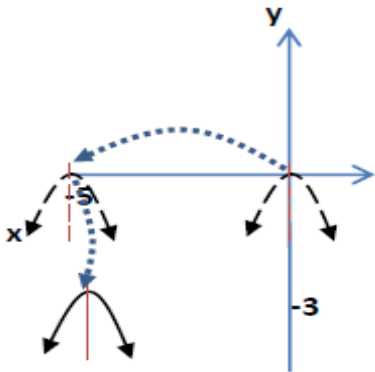
**Note:**  
 In general, the transformation of Quadratic equation will have the form:

$$y = \pm a(x \pm b)^2 \pm c$$

Shape ±    Stretching    Shifting along x – axis    Shifting along y – axis

The table below shows how the transformation works by shifting the basic shape:

General Form	Explanation	Diagram	Example
$y = \pm x^2$ This is the basic shape to start with. It will be at the origin (0,0) with y – axis as the line of symmetry	Shape: $+ x^2$ $- x^2$	Positive shape  Negative shape 	
$y = \pm ax^2$ In front i.e. the coefficient of $x^2$	Stretching: $-1 > a$ and $a > 1$ <i>Narrow</i> $-1 < a < 1$ <i>Wide</i>		
$y = (x \pm b)^2$	Shifting along x-axis: $+ b$ move left $- b$ move right	Horizontal line 	

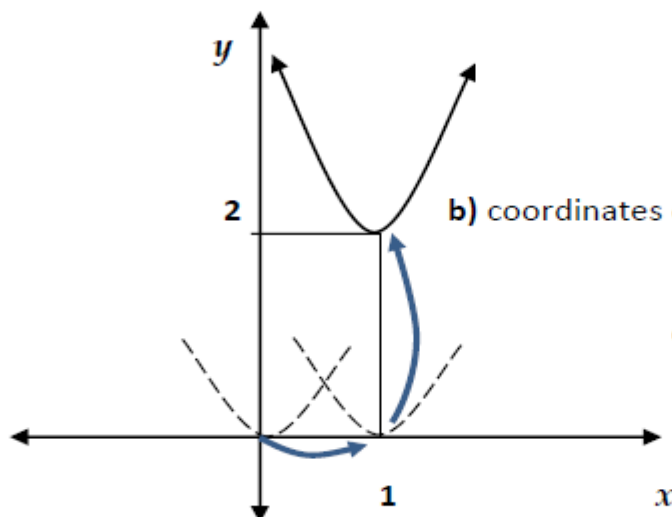
$y = x^2 \pm c$	Shifting along y-axis: + c move up  - c move down		
$y = \pm a(x \pm b)^2 \pm c$	Combination of all shifting	5 unit left and 3 unit down	

**EXAMPLE 1:** The equation is given as  $y = (x - 1)^2 + 2$ .

- (a) Sketch the graph. Clearly show the intercepts
- (b) Give the coordinates of the vertex
- (c) State the range of the function

**Answers:**

a)



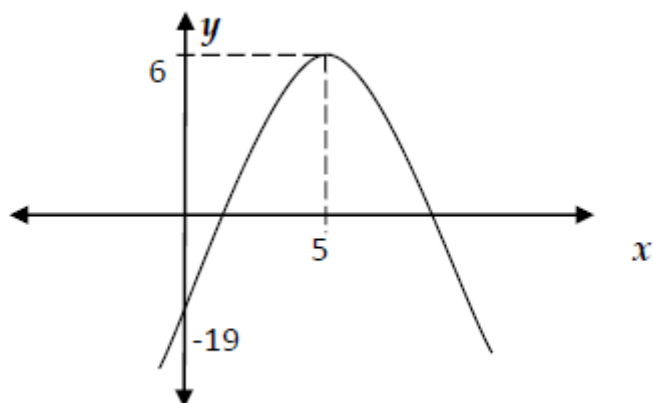
b) coordinates of the vertex: (1, 2)

c) Range  $\{y : y \geq 2, y \in \mathbb{R}\}$

## ACTIVITY

1.

The diagram given below shows the graph of  $y = f(x)$

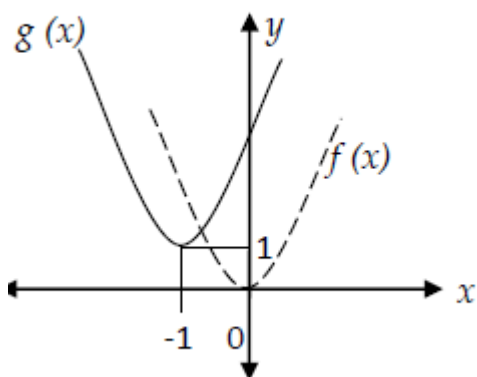


Find the equation of the graph of  $f(x)$

(2 marks)

2.

The graph of  $f(x)$  has been transformed to  $y = g(x)$  and the resulting graph is shown. Find the most appropriate equation for  $g(x)$ .



(2 marks)

3.

The equation is given as  $y = -(x + 2)^2 - 1$ .

(a) Sketch the graph. Clearly show the intercepts

(3 marks)

(b) Give the coordinates of the vertex

(1 mark)

(c) Identify the axis of symmetry.

(1 mark)

(d) State the range of the function

(1 mark)

**THE END**