## transformations

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answers to exercise 1 :  $(i) \land (3, 1)$ 

2.

1. (i)  $A_1(3, 1)$ , (ii)  $A_2(0, 1)$ , (iii)  $A_3(2, 2)$ 

(b) (i) A translation through 1 unit in the x-direction. (ii) Translations through 1 unit in both x and y directions. (c) f(x) > 1

3. (ii)  $x^2$  is mapped onto  $3+2x-x^2$  by the following transformations: a translation of 1 unit in the x-direction, a reflection in the x-axis, a translation of 4 units in the y-direction.

TEST :

1. 
$$f(x) = (x-2)^2 - 1$$

(a) (i) State the axis of symmetry of the graph of 
$$y = f(x)$$
. [1]

- (ii) State the minimum value of f(x). [1]
- (iii) Evaluate f(0), f(1), f(3) and f(4), [1]

(b) (i) Sketch the graph of 
$$y = |f(x)|$$
 for  $0 \le x \le 4$  [3]

(ii) Use your graph to determine the values of x for which |f(x)| = 1. [2]

2.

3.

 $g(x) = \cos x$ The diagram shows the graph of  $y = g(x) \text{ for } 0 \le x \le \pi$ Sketch the graph of  $y = -\cos(x - \frac{\pi}{2})$ and show the coordinates of the images

the points A and B on your graph.



The diagram shows the graph of y = f(x), where  $f(x) = e^x$ . Sketch on separate axes the graphs of

(i) 
$$v = e^{-x}$$

(ii) 
$$y = -e^{-x}$$

(iii)  $y = 3 - e^{-x}$ .  $0 \le x \le 4$ In each case show the coordinates of the image of A.

