

Semester 1 Review – Part 5: Transformations. You may use calculators on these problems

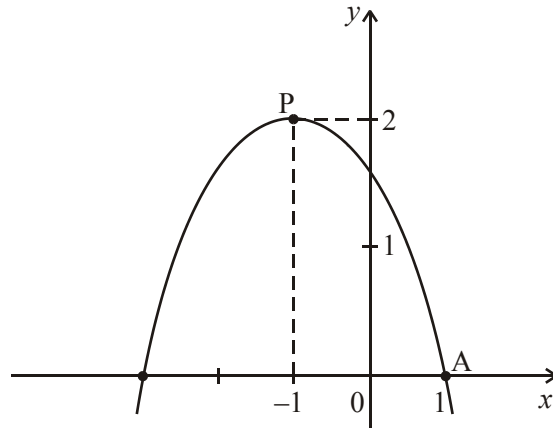
1. The diagram shows part of the graph of $g(x) = a(x - h)^2 + k$. The graph has its vertex at P, and passes through the point A with coordinates (1, 0). Think of this as a transformation of the function $f(x) = x^2$.

(a) Write down the value of

(i) h ;

(ii) k .

(b) Calculate the value of a .



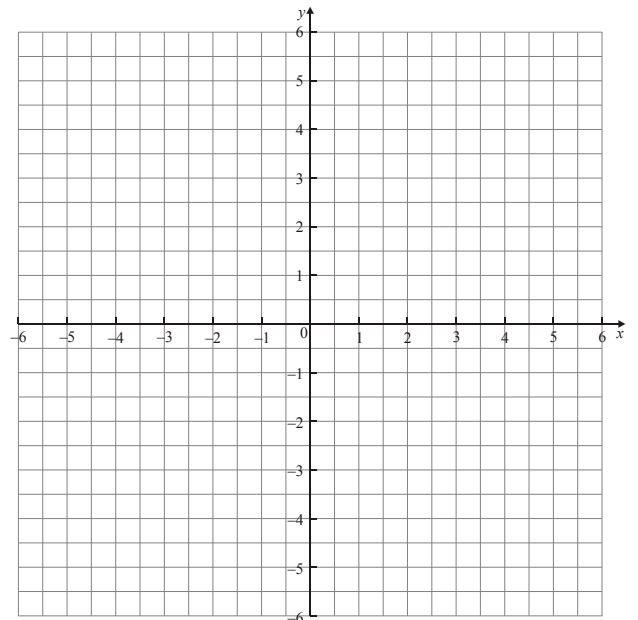
2. Let $f(x) = x^2 - 5$.

(a) On the grid below draw the graph of $f(x)$ for $-3 \leq x \leq 3$.

(b) Let $g(x) = f(x + 3) + 2$. On the grid below draw the graph of $g(x)$ for $-6 \leq x \leq 0$.

(c) What is the Range of $g(x)$?

Range: _____



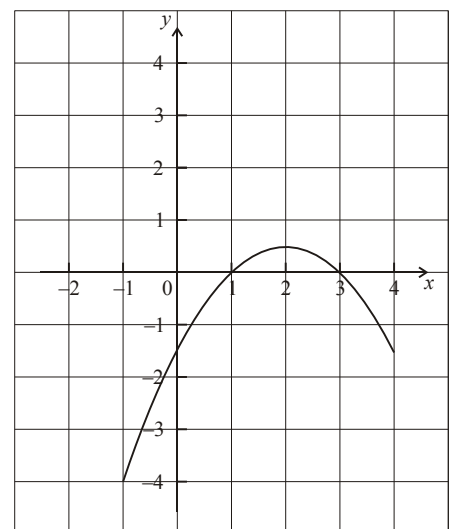
3. Part of the graph of a function f is shown in the diagram below.

(a) On the same diagram sketch the graph of $y = -f(x)$.

(b) Let $g(x) = f(x + 3)$.

i) Find $g(-3)$.

ii) Describe fully the transformation that maps the graph of $f(x)$ to the graph of $g(x)$.



4. Let $f(x) = 3x^2$. The graph of f is translated 1 unit to the right and 2 units down.

The graph of g is the image of the graph of f after this translation.

(a) Write down the coordinates of the vertex of the graph of g .

(b) Express g in the form $g(x) = 3(x - p)^2 + q$.

The graph of h is the reflection of the graph of g over the x -axis.

(c) Write down the coordinates of the vertex of the graph of h .

5. The sketch shows part of the graph of $y = f(x)$ which passes through the points A(-1, 3), B(0, 2), C(1, 0), D(2, 1) and E(3, 5).

A second function is defined by $g(x) = 2f(x - 1)$.

(a) Calculate $g(0)$, $g(1)$, $g(2)$ and $g(3)$.

(b) On the same axes, sketch the graph of the function $g(x)$.

