Marked example 2

Paper 1 style · No calculator

2 6 marks SL 2.11 ●●○ Typical

Let $f(x) = x^2$ and $g(x) = -(x+2)^2 + 5$. The graph of g is obtained from the graph of f by three transformations.

(a) Describe these three transformations, in order. **[3]**

(b) Write down the coordinates of the vertex of the graph of g. **[1]**

(c) Write $g(x)$ in the form $ax^2 + bx + c$. **[2]**

MARKSCHEME (a)

translation 2 units to the left **A1**

reflection in the x-axis **A1**

translation 5 units up **A1**

Total 3 marks

Note Accept the vectors $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$ and $\begin{pmatrix} 0 \\ 5 \end{pmatrix}$. The reflection must come before the upward translation.

MARKSCHEME (b)

$(-2, 5)$ **A1**

Total 1 mark

MARKSCHEME (c)

$-\left(x^2 + 4x + 4\right) + 5$ **(M1)**

$-x^2 - 4x + 1$ **A1**

Total 2 marks

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