5. *[Maximum mark: 6]*

Let $f(x) = x^2$ and $g(x) = 2(x-1)^2$.

(a) The graph of *g* can be obtained from the graph of f using two transformations. Give a full geometric description of each of the two transformations. *[2 marks]*

(b) The graph of *g* is translated by the vector $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ to give the graph of *h*.

The point $(-1, 1)$ on the graph of f is translated to the point P on the graph of *h*. Find the coordinates of P. *[4 marks]*

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QUESTION 5

(a) in any order

translated 1 unit to the right	***A1***	***N1***
stretched vertically by factor 2	***A1***	***N1***

(b) **METHOD 1**

Finding coordinates of image on g	***(A1)(A1)***	
e.g. $-1+1=0, 1\times 2=2$, $(-1, 1)\rightarrow(-1+1, 2\times 1)$, $(0, 2)$		
P is $(3, 0)$	***A1A1***	***N4***

METHOD 2

$h(x)=2(x-4)^2-2$	***(A1)(A1)***	
P is $(3, 0)$	***A1A1***	***N4***

[6 marks]