Exercise 2

Paper 1 style · No calculator

2 6 marks SL 2.11 ●●○ Typical

Let $f(x) = x^3$ and $g(x) = 2(x-1)^3 - 4$. The graph of g is obtained from the graph of f by three transformations.

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

(b) The point $(2, 8)$ lies on the graph of f. Find the coordinates of its image on the graph of g. **[2]**

(c) Write down the coordinates of the image of the origin. **[1]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

translation 1 unit to the right — A1

vertical stretch, scale factor 2 — A1

translation 4 units down — A1

Total 3 marks

Note The stretch must come before the downward translation.

MARKSCHEME (b)

$(2+1,\ 2\times 8-4)$ — (M1)

$(3,\ 12)$ — A1

Total 2 marks

MARKSCHEME (c)

$(1,\ -4)$ — A1

Total 1 mark