## Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

**2.1 C** – g(5)=3, then f(3)=10. A has no correct inside-then-outside substitution; B stops at f(5); D computes g(f(5)), reversing the order.

Correct response linked to the given case.

**2.2 D** – Solve y=4x-8 for x=(y+8)/4. A is a reciprocal rather than an inverse; B does not undo multiplication by 4; C subtracts 8 where solving requires adding it.

Correct response linked to the given case.

**2.3** 5 – The horizontal shift is right by 5.

Correct response linked to the given case.

**2.4** False – Two different inputs can share an output; a branch restriction is needed.

Correct response linked to the given case.

**3.1** $f(g(x)) = 1/(x^2 + 3 - 3) = 1/x^2$, excluding $x = 0$. For the other order, $f(4) = 1$ and $g(1) = 4$. Composition order changes both operation and possibly domain; $f(g(4)) = 1/16$ is different.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence
. Accurate conditions, checks or qualification.

**3.2** Solve $y = (x + 2)^2$ with $x + 2 \leq 0$ to get $x = -2 - \sqrt{y}$. Thus $h^{-1}(x) = -2 - \sqrt{x}$, domain $x \geq 0$, range $y \leq -2$. The plus branch returns values outside the chosen original domain.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

**3.3** $g(x) = 3(x + 4)^2 - 2$ has vertex $(-4, -2)$ and range $y \geq -2$. Old point $(1, 1)$ maps to $(-3, 1)$ because $3(1) - 2 = 1$; substitution confirms $g(-3) = 1$.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.