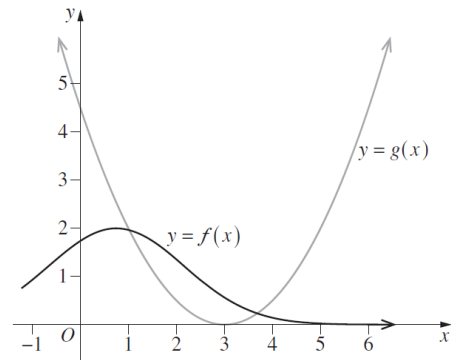


**20 10 MA** The graph shows two functions  $y = f(x)$  and  $y = g(x)$ .

Define  $h(x) = f(g(x))$ .

How many stationary points does  $y = h(x)$  have for  $1 \leq x \leq 5$ ?

- A. 0
- B. 1
- C. 2
- D. 3



1

## D

$$y = h(x)$$

$$y = f(g(x))$$

$$y' = f'(g(x)) \cdot g'(x) \quad (\text{using chain rule})$$

For stationary points,  $f'(g(x)) \cdot g'(x) = 0$ :

$$g'(x) = 0. \quad \text{OR} \quad f'(g(x)) = 0.$$

From the graph,  $g'(3) = 0$ .

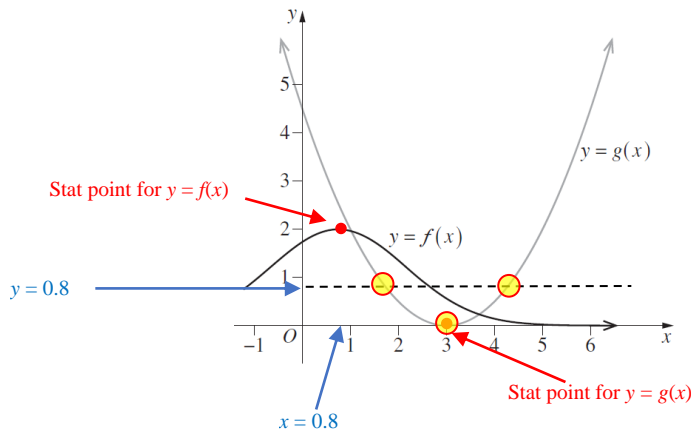
$\therefore$  1 stationary point (at  $x = 3$ ).

From the graph,  $f'(0.8) = 0$ .

But  $g(x) = 0.8$  when  $x = 1.7$  and  $x = 4.3$

$\therefore$  2 stationary points (at  $x = 1.7$  and  $4.3$ ).

Hence, there are 3 stationary points.



State Mean:  
**0.11/1**

\* These solutions have been provided by [projectmaths](http://projectmaths.com.au) and are not supplied or endorsed by NESA.

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