

Thinking Questions

4) The function $h(x) = 3x^2 - x^3$ has been translated left 1 unit and vertically stretched by a factor of 2.

(a) Determine the equation for the transformed function, $g(x)$, in factored form.

$$h(x) = -x^3 + 3x^2$$

$$2h(x) = 2(-x^3 + 3x^2)$$

$$2h(x+1) = 2(-(x+1)^3 + 3(x+1)^2)$$

$$g(x) = 2(x+1)^2[-(x+1) + 3]$$

$$g(x) = 2(x+1)^2(-x-1+3) = 2(x+1)^2(-x+2)$$

$$g(x) = -2(x+1)^2(x-2)$$

(b) determine the zeroes of the transformed function and state the order of each zero.

$$g(x) = -2(x+1)^2(x-2)$$

$$\text{Set } -2(x+1)^2(x-2) = 0$$

$$x+1=0 \quad \text{or} \quad x-2=0$$

$$x = -1$$

(order 2)

$$x = 2$$

(order 1)