Question	Scheme	Marks	AOs
5(a)	Attempts to find the value of $\frac{dy}{dx}$ at $x = 2$	M1	1.1b
	$\frac{dy}{dx} = 6x \Rightarrow$ gradient of tangent at <i>P</i> is 12	A1	1.1b
		(2)	
(b)	Gradient $PQ = \frac{3(2+h)^2 - 2 - 10}{(2+h) - 2}$ oe	B1	1.1b
	$=\frac{3(2+h)^{2}-12}{(2+h)-2}=\frac{12h+3h^{2}}{h}$	M1	1.1b
	=12+3h	A1	2.1
		(3)	
(c)	Explains that as $h \rightarrow 0$ , $12+3h \rightarrow 12$ and states that the gradient of the chord tends to the gradient of (the tangent to) the curve	B1	2.4
		(1)	
(6 marks)			

## Notes

## **(a)**

M1: Attempts to differentiate, allow  $3x^2 - 2 \rightarrow ...x$  and substitutes x = 2 into their answer

A1: cso 
$$\frac{dy}{dx} = 6x \Rightarrow$$
 gradient of tangent at *P* is 12

## **(b)**

B1: Correct expression for the gradient of the chord seen or implied.

**M1:** Attempts  $\frac{\delta y}{\delta x}$ , condoning slips, and attempts to simplify the numerator. The denominator must be *h* 

A1: cso 12 + 3h

(c)

**B1:** Explains that as  $h \rightarrow 0$ ,  $12+3h \rightarrow 12$  and states that the gradient of the chord tends to the gradient of the curve