Question	Scheme	Marks	AOs
14	$y = \dfrac{x-4}{2+\sqrt{x}} \Rightarrow \dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{2+\sqrt{x}-(x-4)\frac{1}{2}x^{-\frac{1}{2}}}{\left(2+\sqrt{x}\right)^2}$	M1 A1	2.1 1.1b
	$= \dfrac{2+\sqrt{x}-(x-4)\frac{1}{2}x^{-\frac{1}{2}}}{\left(2+\sqrt{x}\right)^2} = \dfrac{2+\sqrt{x}-\frac{1}{2}\sqrt{x}+2x^{-\frac{1}{2}}}{\left(2+\sqrt{x}\right)^2} = \dfrac{2\sqrt{x}+\frac{1}{2}x+2}{\sqrt{x}\left(2+\sqrt{x}\right)^2}$	M1	1.1b
	$= \dfrac{x+4\sqrt{x}+4}{2\sqrt{x}\left(2+\sqrt{x}\right)^2} = \dfrac{\left(2+\sqrt{x}\right)^2}{2\sqrt{x}\left(2+\sqrt{x}\right)^2} = \dfrac{1}{2\sqrt{x}}$	A1	2.1
		(4)	
		(4 marks)	
	Notes		

M1: Attempts to use a correct rule e.g. quotient or product (& chain) rule to achieve the following forms

Quotient : $\dfrac{\alpha\left(2+\sqrt{x}\right)-\beta(x-4)x^{-\frac{1}{2}}}{\left(2+\sqrt{x}\right)^2}$ but be tolerant of attempts where the $\left(2+\sqrt{x}\right)^2$ has been

incorrectly expanded $\qquad$ Product: $\alpha\left(2+\sqrt{x}\right)^{-1}+\beta x^{-\frac{1}{2}}(x-4)\left(2+\sqrt{x}\right)^{-2}$

Alternatively with $t = \sqrt{x}, \quad y = \dfrac{t^2-4}{2+t} \Rightarrow \dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{\mathrm{d}y}{\mathrm{d}t} \times \dfrac{\mathrm{d}t}{\mathrm{d}x} = \dfrac{2t(2+t)-\left(t^2-4\right)}{\left(2+t\right)^2} \times \dfrac{1}{2}x^{-\frac{1}{2}}$ with same rules

A1: Correct derivative in any form. Must be in terms of a single variable (which could be t)

M1: Following a correct attempt at differentiation, it is scored for multiplying both numerator and

denominator by $\sqrt{x}$ and collecting terms to form a single fraction. It can also be scored from $\dfrac{uv'-vu'}{v^2}$

For the $t = \sqrt{x}$, look for an attempt to simplify $\dfrac{t^2+4t+4}{\left(2+t\right)^2} \times \dfrac{1}{2t}$

A1: Correct expression showing all key steps with no errors or omissions. $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ must be seen at least once

Question	Scheme	Marks	AOs
14	$y = \dfrac{x-4}{2+\sqrt{x}} \Rightarrow y = \dfrac{\left(\sqrt{x}+2\right)\left(\sqrt{x}-2\right)}{2+\sqrt{x}} = \sqrt{x}-2$	M1 A1	2.1 1.1b
	$\dfrac{\mathrm{d}y}{\mathrm{d}x} = \dfrac{1}{2\sqrt{x}}$	M1 A1	1.1b 2.1
		(4)	
		(4 marks)	

Notes

M1: Attempts to use difference of two squares. Can also be scored using

$$t = \sqrt{x} \Rightarrow y = \frac{t^2 - 4}{t + 2} \Rightarrow y = \frac{(t+2)(t-2)}{t+2}$$

A1: $y = \sqrt{x} - 2$ or $y = t - 2$

M1: Attempts to differentiate an expression of the form $y = \sqrt{x} + b$

A1: Correct expression showing all key steps with no errors or omissions. $\dfrac{dy}{dx}$ must be seen at least once