Question Number	Scheme	Marks
10(a)	$m=\frac{4}{5}$	B1
	$y+3=\frac{4}{5}(x-4)$ or $-3=\frac{4}{5}\times 4+c\Rightarrow c=...$	M1
	$y=\frac{4}{5}x-\frac{31}{5}$	A1
		(3)
(b)	$f'(4)=\frac{4}{5}\Rightarrow\frac{k\sqrt{4}(4-3)}{5}=\frac{4}{5}\Rightarrow k=...$	M1
	$k=2$	A1
		(2)
(c)	$(f'(x)=)\frac{2\sqrt{x}(x-3)}{5}=\frac{2x^{\frac{3}{2}}}{5}-\frac{6x^{\frac{1}{2}}}{5}$	M1
	$(f(x)=)\frac{4x^{\frac{5}{2}}}{25}-\frac{4x^{\frac{3}{2}}}{5}(+c)$	M1 A1ft
	$x=4, y=-3\Rightarrow -3=\frac{4(4)^{\frac{5}{2}}}{25}-\frac{4(4)^{\frac{3}{2}}}{5}+c\Rightarrow c=\left(-\frac{43}{25}\right)$	ddM1
	$(f(x)=)\frac{4x^{\frac{5}{2}}}{25}-\frac{4x^{\frac{3}{2}}}{5}-\frac{43}{25}$	A1
		(5)
		(10 marks)

Question Number	Scheme	Marks
11 (a)	Gradient of normal $=\frac{1}{4}$	B1
	Equation of normal $(y+50)="\frac{1}{4}"(x-4)\Rightarrow y=\frac{1}{4}x-51$	M1 A1
		(3)
(b)	$(f''(x)=)\ \frac{6}{\sqrt{x^3}}+x=6x^{-\frac{3}{2}}+x\Rightarrow f'(x)=-12x^{-\frac{1}{2}}+\frac{1}{2}x^2+k$	M1 A1
	Substitutes $x=4,\ f'(x)=-4\Rightarrow k=-6$	dM1 A1
	$(f'(x)=)\ -12x^{-\frac{1}{2}}+\frac{1}{2}x^2-6\Rightarrow(f(x)=)\ -24x^{\frac{1}{2}}+\frac{1}{6}x^3-6x+d$	dM1 A1ft
	Substitutes $x=4,\ f(x)=-50\Rightarrow d=\frac{34}{3}$	dddM1
	$(f(x)=)-24x^{\frac{1}{2}}+\frac{1}{6}x^3-6x+\frac{34}{3}$	A1
		(8)
		(11 marks)

Question Number	Scheme	Marks
1.	$\int 12x^3 + \frac{1}{6\sqrt{x}} - \frac{3}{2x^4}\,dx = 12\times\frac{x^4}{4} + \frac{1}{6}\times 2x^{\frac{1}{2}} - \frac{3}{2}\times\frac{x^{-3}}{-3}$	M1
	$= 3x^4 + \frac{1}{3}x^{\frac{1}{2}} + \frac{1}{2}x^{-3} + c$	A1A1A1A1
		(5)
		(5 marks)