Question Number	Scheme	Marks
9(a)	$\dfrac{x^3-2x^2-5x+6}{x+2}=x^2-4x+3$	M1
	$x^2-4x+3=(x-3)(x-1)\Rightarrow x=1\ ,\ 3$	M1(NB A1 on e-PEN)
(i)	so $a=1$ *	A1cso
(ii)	$b=3$	A1 (B1 on e-PEN) (4)
	Correct answers w/o working scores 0/4	
(b)	$\dfrac{dy}{dx}=3x^2-4x-5$ when $x=2$, $\dfrac{dy}{dx}=-1$	M1A1
	$x=2,\ \ y=-4$	B1
	$(y--4)=-1(x-2)$	M1A1
	when $y=0, x=-2$ *	A1cso (6)
ALT		
	$x=2,\ \ y=-4$	B1
	$\dfrac{dy}{dx}=3x^2-4x-5$ when $x=2$, $\dfrac{dy}{dx}=-1$	M1A1
	Grad of line from P to $(-2,0)=-1$	M1A1
	Same gradient so l passes through (-2,0)	A1cso
(c)	Area $=\int_{-2}^{2}(x^3-2x^2-5x+6)\ dx-\int_{-2}^{2}(-x-2)\ dx=\int_{-2}^{2}(x^3-2x^2-4x+8)\ dx$	M1
	$=\left[\dfrac{x^4}{4}-\dfrac{2x^3}{3}-2x^2+8x\right]_{-2}^{2}$	M1
	$=\left(4-\dfrac{16}{3}-8+16\right)-\left(4+\dfrac{16}{3}-8-16\right)$	dM1
	$=\dfrac{64}{3}$	A1 (4)
		[14]
ALT	By splitting the area:	
	Area $=\int_{-2}^{1}(x^3-2x^2-5x+6)\ dx+\Delta[(-2,0),(2,0),P]-\left\|\int_{1}^{2}(x^3-2x^2-5x+6)\ dx\right\|$	M1
	Integrate curve equation (ignore limits) and attempt area of triangle by formula or integration	M1
	Substitute **correct** limits	dM1
	$=\dfrac{64}{3}$	A1
NB	No algebraic integration – only first M mark available	

Question Number	Scheme	Marks
(a)		
(i)M1	Obtain the quadratic factor by division or inspection Factor theorem allowed **only** if values for *a* **and** *b* are found.	
M1 (A1 on e-PEN)	Factorise the quadratic factor	
A1cso	Correct **given** value for *a*	
(ii)A1 (B1 on e-PEN)	Correct value for *b*	
	By Factor Theorem: M1 Test $x=1$ M1 Test another value which is > 1 A1 $a=1$ A1 $b=3$	
(b)		
M1	Differentiate and substitute $x = 2$ to find the gradient of the tangent to *C* at *P*	
A1	Correct gradient of tangent	
B1	$y=-4$ seen explicitly or used in the equation of the tangent	
M1	Any **complete** method for the equation of the tangent at $(2,\ \text{their } y)$. Use of $y=mx+c$ must include an attempt at finding a value for *c*	
A1	Correct numbers in their (unsimplified) equation	
A1cso	Correct *x* coordinate of the point where the tangent crosses the *x*-axis. No errors seen	
ALT	**for the last 3 marks:** Find the gradient of the line from *P* to $(-2,0)$ M1 Any correct method; A1correct gradient All work correct and a conclusion. A1cso	
(c)		
M1	Using area $=\int \text{curve}-\text{line}$ or $\int \text{line}-\text{curve}$ with their line equation limits **are** needed	
M1	Attempt to integrate the single function or two functions (ie all the integration needed) limits not needed. $\int_{-2}^{2}(-x-2)\,dx$ may be obtained by triangle formula.	
dM1	Substitute **correct** limits in their integrated function(s) Depends on both M marks	
A1	Correct final answer. Must be positive.	
ALT	By splitting the area	
M1	Suitable split eg as shown Limits are needed	
M1	Attempt all the nec integration (ignore limits) and area of triangle by integration or formula	
dM1	Substitute **correct** limits in their integrated function(s) Depends on both M marks	
A1	Correct final answer	