Question	Answer	Marks	Guidance
6(b)	$\ln y = x^2 \ln b + \ln A$	**B1**	May be seen in part **(a)**
	Gradient = $\ln b$ $(\ln b = 0.7)$ $b = 2$	**2**	**M1** for attempt to find the gradient and equate to $\ln b$ Gradient must be from linear graph of ln*y* vs x^2
	Intercept = $\ln A$ $(\ln A = 1.95)$ $A = 7$	**2**	**M1** for attempt to use intercept
6(c)	When $y = 200$, $\ln y = 5.3$ $x^2 = 4.85$ $x = 2.2$ (allow 2.1 or 2.3)	**2**	**M1** for using *their* linear graph with $\ln y = 5.3$ to obtain a value for x^2 **A0** for $x = \pm 2.2$ if –2.2 is not rejected
7(a)	$x^2 + 3x^2 \ln x$	**2**	**M1** for attempt to differentiate a product Allow unsimplified for 2 marks
7(b)	$\int 3x^2 \ln x \, dx = x^3 \ln x - \int x^2 dx$	**B1**	
	$\left[x^3 \ln x - \frac{x^3}{3} \right]_1^2$ $8\ln 2 - \frac{8}{3} + \frac{1}{3}$	**M1**	Dep on **B1 M1** for correct use of limits
	$\ln 256 - \frac{7}{3}$	**2**	**A1** for one correct term
8(a)	$5x^2 + 3x - 14 = 0$ or $5y^2 - 4y - 57 = 0$	**M1**	soi
	$x = \frac{7}{5}$, $y = \frac{19}{5}$ $x = -2$, $y = -3$	**3**	**M1** for attempt to solve *their* quadratic to obtain either *x* = ... or *y* = … **A1** for one correct pair both *x* or both *y* or one correct (*x*, *y*) point
	Midpoint $\left(-\frac{3}{10}, \frac{2}{5} \right)$	**B1**	Must be correct midpoint
	Gradient of perpendicular $-\frac{1}{2}$	**B1**	Must be correct
	Perp bisector: $y - \frac{2}{5} = -\frac{1}{2}\left(x + \frac{3}{10} \right)$	**M1**	Must be using *their* midpoint and a gradient = $-\frac{1}{2}$
	$k = -\frac{4}{5}$	**A1**	

© Cambridge University Press & Assessment 2024

Question	Answer	Marks	Guidance
8(b)	$\left(\frac{9}{2},\ -2\right)$	**2**	**B1** for one correct **FT** on $2\times(their\ k)-their\frac{2}{5}$
	$\left(-\frac{51}{10},\ \frac{14}{5}\right)$	**2**	**B1** for one correct **FT** on $\left[\left(3\times their\ \frac{2}{5}\right)-(2\times their\ k)\right]$
9(a)	$\mathbf{c}-2\mathbf{a}$	**B1**	
9(b)	$4\mathbf{a}+\frac{2}{3}(their\ (\mathbf{c}-2\mathbf{a}))$ oe	**M1**	Alternative route: $OC + CB + BD = \mathbf{c} + 2\mathbf{a} - \frac{1}{3}\ their\ AB$
	$\frac{8}{3}\mathbf{a}+\frac{2}{3}\mathbf{c}$	**A1**	Allow unsimplified
9(c)	$\mu\left(their\ \left(\frac{8}{3}\mathbf{a}+\frac{2}{3}\mathbf{c}\right)\right)$	**B1**	Must be in terms of **a** and **c** in a valid vector form. Allow unsimplified
9(d)	$\overrightarrow{AC}=\mathbf{c}-4\mathbf{a}$	**B1**	
	$\lambda(their\ (\mathbf{c}-4\mathbf{a}))$	**B1**	Must be in terms of **a** and **c** in a valid vector form
9(e)	$4\mathbf{a}=$ *their* (c) – *their* (d) oe	**M1**	Must be in terms of **a** and **c** in a valid vector form
	$\lambda=\frac{1}{2},\ \mu=\frac{3}{4}$	**3**	**M1 dep** on first M1 for equating like vectors once **M1 dep** on first M1 for attempt to solve 2 simultaneous equations in λ and μ. leading to $\lambda=\ldots$ or $\mu=\ldots$ **A1** for both
10(a)	$\tan\theta=\frac{2}{7},\ \ \tan\theta=-1$	**2**	**M1** for attempt to factorise or use formula to obtain $\tan\theta=...$
	$15.9^{o},\ -164.1^{o},\ -45^{o},\ 135^{o}$	**2**	**A1** for two correct solutions **A1** for a further 2 correct solutions and no extras in the range

© Cambridge University Press & Assessment 2024