Question	Answer	Marks	Partial Marks
6(a)	$\sqrt{16^2+7.5^2-2(16)(7.5)\cos\frac{2\pi}{7}}$ $+(16-7.5)+16\times\frac{2\pi}{7}$ oe, soi	**M2**	**M1** for $\sqrt{16^2+7.5^2-2(16)(7.5)\cos\frac{2\pi}{7}}+(16-7.5)$ or for $16\times\frac{2\pi}{7}$ seen
	35.6 or 35.6 to 35.614	**A1**	
6(b)	$\frac{1}{2}\times16^2\times\frac{2\pi}{7}-\frac{1}{2}\times16\times7.5\times\sin\left(\frac{2\pi}{7}\right)$ oe	**M2**	**M1** for either $\frac{1}{2}\times16^2\times\frac{2\pi}{7}$ or $\frac{1}{2}\times16\times7.5\times\sin\left(\frac{2\pi}{7}\right)$
	68[.0] or 67.98 to 68.0	**A1**	
7(a)	$\frac{dy}{dx}=3x^2-8x+6$	**B1**	
	Finds *their* $\left.\frac{dy}{dx}\right\|_{x=3}$	**M1**	condone one slip
	$m_{T_1}=9$	**A1**	
	$y-8=$ *their* $9(x-3)$ or $y=9x+c$ and $8=9(3)+c$	**M1**	
	$y=9x-19$ cao	**A1**	
7(b)(i)	$m_{T_2}=\frac{1}{\text{their}\,9}$	**B1**	**FT** *their* 9
7(b)(ii)	[Uses $y=x$ in *their* ($y=9x-19$) to form] *their* ($x=9x-19$) or *their* ($y=9y-19$) oe and solves for x or y or solves e.g. *their* $(9x-19)=$ *their* $\frac{x+19}{9}$	**M1**	
	$\left(\frac{19}{8},\frac{19}{8}\right)$ oe	**A1**	**FT** equal x and y coordinates providing at least 3 marks earned in **(a)**
8(a)(i)	479 001 600 oe	**B1**	
8(a)(ii)	$3\times10!\times4$ oe	**M1**	
	43 545 600 oe	**A1**	

Question	Answer	Marks	Partial Marks
8(a)(iii)	$5! \times 8 \times 7!$ oe	**M1**	
	4 838 400 oe	**A1**	
8(b)(i)	${}^{9}C_{3}$	**M1**	
	84	**A1**	
8(b)(ii)	${}^{3}C_{1} \times {}^{4}C_{1} \times {}^{5}C_{1}$ oe	**M1**	
	60	**A1**	
9(a)	Identifies the correct term: ${}^{5}C_{2} \times (2k)^{3} \times \left(-\frac{1}{k}\right)^{2}$ $[\times x^{2}]$ oe, soi	**B1**	
	$10 \times \frac{8k^{3}}{k^{2}} = 160$ soi	**M1**	**FT** only for correct term with bracketing errors; condone one slip in simplification
	$k = 2$ nfww	**A1**	
9(b)(i)	$1 + 18x + 135x^{2}$	**B2**	**B1** for any 2 terms correct or for all 3 correct terms listed but not summed or **M1** for a correct unsimplified expansion e.g. : $1 + 6(3x) + 15(3x)^{2}$
9(b)(ii)	Uses constant/coefficient of x to find $a = -2$ only	**B2**	**B1** for both $a = 2$ and -2 or for both $a = \frac{17}{9}$ and -2
	$b = 469$ only	**B1**	**FT** *their* calculated value of a
10(a)(i)	Range f^{-1}: $0.5 \leqslant f^{-1} \leqslant 1.5$	**B1**	
	Domain f^{-1}: $0 \leqslant x \leqslant \frac{2\sqrt{2}}{3}$ oe	**B2**	**B1** for 0 and $\frac{2\sqrt{2}}{3}$ in an incorrect inequality or for $x \geqslant 0$ or $x \leqslant \frac{2\sqrt{2}}{3}$