Question	Answer	Marks	Guidance
7(a)(iii)	$n\overrightarrow{AB} = m\overrightarrow{BC}$	**M1**	For substitution of *their* **(i)** and **(ii)** into $n\overrightarrow{AB} = m\overrightarrow{BC}$
	$n\mathbf{a} + m\mathbf{c} = (m+n)\mathbf{b}$	**A1**	For correct manipulation to obtain the **given answer**
7(b)	$2\lambda - 4\mu + 4 = 4\lambda + 4$ or $\lambda + 7\mu - 7 = -2\lambda - 2$	**M1**	For equating like components at least once, allow unsimplified
		M1	**Dep** for solving *their* equations to obtain both λ and μ
	$\mu = 5$	**A1**	
	$\lambda = -10$	**A1**	
8(a)	**Either** Starting with a 6: 120 ways	**B1**	May be implied by final answer
	Starting with 5, 7 or 9: 540 ways	**B1**	May be implied by final answer
	Total 660	**B1**	
	Or Alternative 1 Ending with a 6: 180 ways	**(B1)**	May be implied by final answer
	Ending with 0 or 4: 480ways	**(B1)**	May be implied by final answer
	Total 660	**(B1)**	
	Or Alternative 2 11 ways of obtaining even 5-digit numbers which start with 5, 6, 7, 9	**(B1)**	For $11 \times k$ May be implied by final answer
	${}^5P_3$ ways of arranging remaining 3 digits: 60	**(B1)**	For $m \times 60$ where m is from an attempt to list all cases for first and last digits May be implied by final answer
	$11 \times 60 = 660$	**(B1)**	
	Or Alternative 3 Total arrangements ${}^7P_5$ minus (all odds + evens starting with 1 + evens starting with 0 or 4) = 2520 – (1440 + 180 + 240)	**(B2)**	For 2520 – (1440 + 180 + 240)
	660	**(B1)**	

Question	Answer	Marks	Guidance
8(b)	$\frac{n!}{(n-4)!4!}=\frac{6n!}{(n-2)!2!}$	**B1**	
	$(n-2)(n-3)=72$	**2**	**B1** for $(n-2)(n-3)$
			B1 for 72
	$n=11$ only	**2**	**M1** for correct attempt to form and solve a quadratic equation **A1** for $n=11$ only
9(a)	$AOD=2\times\tan^{-1}\left(\frac{2}{3}\right)$	**M1**	For correct method to find *AOD*
	$AOD=1.1760...$ $AOD=1.176$ [to 3dp]	**A1**	Need to see 4 dp or more to justify 3 dp answer
9(b)	Major arc $MN=(2\pi-1.176)12$	**B1**	
	ND or $MA=12-\sqrt{13}$	**B1**	
	Perimeter = major arc *MN* + *MA* + *ND* + 16 oe	**B1**	For *their* values in a correct plan, may be implied by a correct answer
	Perimeter = 94.1	**B1**	
9(c)	Minor sector area = $\frac{1}{2}\times1.176\times12^2$ **or** Major sector area = $\frac{1}{2}\times(2\pi-1.176)\times12^2$	**B1**	
	Area = major sector area – remainder of rectangle or Area = area of circle – minor sector area – remainder of rectangle or Area = circle – rectangle – minor sector + triangle *AOD*	**B1**	For *their* values in a correct plan, may be implied by a correct answer
	Area = 350	**B1**	Allow greater accuracy
10(a)	At *A* $y=4$	**B1**	
	At *B* $y=\frac{13}{16}$ or 0.8125	**B1**	