Question	Answer	Marks	Partial marks
7(a)(i)	252	**B1**	
7(a)(ii)	56	**B2**	**B1** for ${}^8C_3$ or $\frac{8!}{5!\times 3!}$ oe
7(a)(iii)	140	**B2**	**B1** for ${}^8C_4 \times 2$ oe or ${}^{10}C_5 - {}^8C_5 - {}^8C_3$ oe
7(b)	483 840	**B3**	**B2** for 8! × 6 [× 2] or 241 920 oe or **B1** for 8! or 40 320 or 8! × 2 or 80 640
8	$\text{cosec}^2 2\theta + 3\text{cosec}\, 2\theta - 10$ [= 0] or $10\sin^2 2\theta - 3\sin 2\theta - 1$ [= 0]	**B2**	**B1** for correctly writing the equation in terms of one trigonometric function e.g. $\text{cosec}^2 2\theta - 1 + 3\,\text{cosec}\, 2\theta = 9$ or $\frac{1-\sin^2 2\theta}{\sin^2 2\theta} + \frac{3}{\sin 2\theta} = 9$
	Solves or factorises *their* 3-term quadratic in $\text{cosec}2\theta$ or $\sin 2\theta$ e.g. $(\text{cosec}\, 2\theta - 2)\,(\text{cosec}\, 2\theta + 5)$ [= 0] or $(2\sin 2\theta - 1)(5\sin 2\theta + 1)$ [= 0]	**M1**	**FT** *their* 3-term quadratic in $\text{cosec}2\theta$ or $\sin 2\theta$
	[$\sin 2\theta = \frac{1}{2}$ $\sin 2\theta = -\frac{1}{5}$ θ =] 15 75 −5.8 or –5.76 to –5.77 −84.2 or –84.23 to –84.232 and no other angles in range; nfww	**A3**	**A2** for any 2 correct, ignoring extras in range; nfww or **A1** for one correct angle or one correct double angle; nfww

Question	Answer	Marks	Partial marks
9(a)	Horizontal line, $v = 6$ for $0 \leqslant t \leqslant 5$	**B1**	
	Horizontal line, $v = -3$ for $5 \leqslant t \leqslant 15$	**B2**	**B1** for horizontal line for $5 \leqslant t \leqslant 15$ with $v = k$ where $k < 0$ or $v = 3$ for $5 \leqslant t \leqslant 15$ or $v = -3$ for $t > 5$ and at least $7 \leqslant t \leqslant 13$ If **0** scored, award: **SC2** for Horizontal line, $v = -6$ for $0 \leqslant t \leqslant 5$ **and** Horizontal line, $v = 3$ for $5 \leqslant t \leqslant 15$ **OR SC1** for Horizontal line, $v = -6$ for $0 \leqslant t \leqslant 5$ **and** Horizontal line for $5 \leqslant t \leqslant 15$ with $v = k$ where $k > 0$
9(b)	Single line with positive gradient passing through (0, –8), (10, 0) and (20, 8)	**B3**	**B2** for a single line with positive gradient • passing through a point indicated as (0, –8) or (20, 8) **and** the point (10, 0) • or passing through points indicated as (0, –8) and (20, 8) which does not pass through (10, 0) or **B1** for a single line with positive gradient • passing through a point indicated as (0, –8) or (20, 8) to or through any point on the t-axis • or passing through (10, 0) but with both endpoints incorrect or unlabelled If 0 scored, award **SC1** for a single line with negative gradient passing through (0, 8), (10, 0) and (20, –8)

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