| 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<br><br>or **B1** for 8! or 40 320<br>or 8! × 2 or 80 640 |
| 8 | $\text{cosec}^2 2\theta + 3\text{cosec}\, 2\theta - 10$ [= 0]<br>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<br>e.g. $\text{cosec}^2 2\theta - 1 + 3\,\text{cosec}\, 2\theta = 9$<br>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.<br>$(\text{cosec}\, 2\theta - 2)\,(\text{cosec}\, 2\theta + 5)$ [= 0]<br>or $(2\sin 2\theta - 1)(5\sin 2\theta + 1)$ [= 0] | **M1** | **FT** *their* 3-term quadratic in $\text{cosec}2\theta$ or $\sin 2\theta$ |
| | [$\sin 2\theta = \frac{1}{2}$<br>$\sin 2\theta = -\frac{1}{5}$<br>$\theta$ = ]<br><br>15<br>75<br>−5.8 or –5.76 to –5.77<br>−84.2 or –84.23 to –84.232<br><br>and no other angles in range; nfww | **A3** | **A2** for any 2 correct, ignoring extras in range; nfww<br><br>or<br>**A1** for one correct angle or one correct double angle; nfww |