| Question | Answer | Marks | Partial Marks |
|---|---|---|---|
| 4(c) | $their \frac{\cos x}{1+\sin x} = \frac{\sin x}{\cos x}$ | **M1** | replace $\tan x$ with $\frac{\sin x}{\cos x}$ |
| | use $\cos^2 x = 1 - \sin^2 x$<br>$\left(2\sin^2 x + \sin x - 1 = 0\right)$ | **M1** | earned when equation reduced to a quadratic in sin*x* |
| | $(2\sin x - 1)(\sin x + 1) = 0$ | **M1** | solve three term quadratic in sin*x* |
| | $x = \frac{\pi}{6}$ | **A1** | or 0.524 or better radians only<br><br>if M0 M0 M0 and (a) and (b) correct, allow SC2 for<br>tan*x* = $\frac{1}{\sqrt{3}}$ , $x = \frac{\pi}{6}$ |
| | $x = \frac{5\pi}{6}$ | **A1** | or 2.62 or better radians only<br>A0 if extra solution(s) in range |
| 5 | express an equation correctly in powers of 3 or powers of 2 | **M1** | |
| | $x + 2y - 2 = 5$ oe $(x + 2y = 7)$ | **A1** | accept unsimpified |
| | $2x + 1 - 2.5 = 3 + y - 0.5$ oe $(2x - y = 4)$ | **A1** | accept unsimplified |
| | solve correct equations for *x* or *y* | **M1** | |
| | $x = 3$ and $y = 2$ | **A1** | |
| 6(a) | 3024 | **B1** | |
| 6(b) | 24 | **B1** | |
| 6(c) | ${}^4P_2 \times {}^5P_2$ | **M1** | 4×3 × 5×4 |
| | 240 no isw | **A1** | |
| 6(d) | ${}^4P_1 \times {}^8P_3$ | **M1** | 4 × 8×7×6 |
| | 1344 no isw | **A1** | |
| 7(a) | $-x\sin x + \cos x$ isw | **B2** | accept unsimplified<br>if incorrect allow B1 for<br>$\frac{d}{dx}(\cos x) = -\sin x$ clearly seen |