Marked example 3

Paper 1 style · No calculator

3 7 marks SL 3.5 · 3.6 ●●○ Typical

It is given that $\cos\theta = -\frac{2}{3}$, where $\frac{\pi}{2} < \theta < \pi$.

(a) Find the exact value of $\sin\theta$. **[3]**

(b) Find the exact value of $\sin 2\theta$. **[2]**

(c) Find the exact value of $\cos 2\theta$. **[2]**

MARKSCHEME (a)

$\sin^2\theta = 1 - \frac{4}{9} = \frac{5}{9}$ **M1**

$\sin\theta > 0$ because $\frac{\pi}{2} < \theta < \pi$ **R1**

$\sin\theta = \frac{\sqrt{5}}{3}$ **A1**

Total 3 marks

MARKSCHEME (b)

$2 \times \frac{\sqrt{5}}{3} \times \left(-\frac{2}{3}\right)$ **M1**

$-\frac{4\sqrt{5}}{9}$ **A1**

Total 2 marks

MARKSCHEME (c)

$2\left(-\frac{2}{3}\right)^2 - 1$ **M1**

$-\frac{1}{9}$ **A1**

Total 2 marks

Note Or $1 - 2\sin^2\theta$, or $\cos^2\theta - \sin^2\theta$.

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