Marked example 1

Paper 1 style · No calculator

1 7 marks AHL 3.9 ●●○ Typical

Find the exact value of

(a) $\arcsin\left(-\frac{1}{2}\right)$; [1]

(b) $\arccos\left(-\frac{\sqrt{2}}{2}\right)$; [1]

(c) $\arcsin\left(\sin\frac{4\pi}{5}\right)$; [2]

(d) $\tan\left(\arcsin\frac{1}{3}\right)$. [3]

MARKSCHEME (a)

$-\frac{\pi}{6}$ A1

Total 1 mark

MARKSCHEME (b)

$\frac{3\pi}{4}$ A1

Total 1 mark

Note In $[0, \pi]$.

MARKSCHEME (c)

$\sin\frac{4\pi}{5} = \sin\frac{\pi}{5}$ M1

$\frac{\pi}{5}$ A1

Total 2 marks

Note $\pi - \frac{4\pi}{5}$, which is in $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$.

MARKSCHEME (d)

$\alpha = \arcsin\frac{1}{3}$, $\cos^2\alpha = 1 - \frac{1}{9} = \frac{8}{9}$ M1

$\cos\alpha = \frac{2\sqrt{2}}{3}$, positive since $-\frac{\pi}{2} \le \alpha \le \frac{\pi}{2}$ R1

$\tan\alpha = \frac{1/3}{2\sqrt{2}/3} = \frac{\sqrt{2}}{4}$ A1

Total 3 marks

Note Or $\frac{1}{2\sqrt{2}}$.

Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization. © 2026 Hence