Exercise 1

Paper 1 style · No calculator

1 5 marks AHL 3.9 ●○○ Routine

Find the exact value of

(a) $\operatorname{cosec} \frac{7\pi}{6}$; [2]

(b) $\cot \frac{5\pi}{3}$; [2]

(c) $\sec^2 \frac{\pi}{6}$. [1]

The markscheme is on the next page: try the question first. 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.
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MARKSCHEME (a)

$\sin\frac{7\pi}{6} = -\frac{1}{2}$ M1

$\operatorname{cosec}\frac{7\pi}{6} = -2$ A1

Total 2 marks

MARKSCHEME (b)

$\frac{\cos\frac{5\pi}{3}}{\sin\frac{5\pi}{3}} = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}}$ M1

$-\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$ A1

Total 2 marks

Note Or $\tan\frac{5\pi}{3} = -\sqrt{3}$, then the reciprocal.

MARKSCHEME (c)

$\frac{4}{3}$ A1

Total 1 mark

Note $\cos\frac{\pi}{6} = \frac{\sqrt{3}}{2}$, so $\sec\frac{\pi}{6} = \frac{2}{\sqrt{3}}$.