Unit-circle definitions and exact values

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. Find $\sin(7\pi/6)$ exactly. [3 marks]

Reference angle $\pi/6$; quadrant III has negative sine.

Answer: $-1/2$

2. Find $\cos(3\pi/4)$ exactly. [3 marks]

Reference angle $\pi/4$; the horizontal coordinate is negative.

Answer: $-\sqrt{2}/2$

3. Find $\tan(5\pi/3)$ exactly. [3 marks]

Reference angle $\pi/3$ in quadrant IV; divide negative sine by positive cosine.

Answer: $-\sqrt{3}$

4. Find $\sin(11\pi/6)$ and $\cos(11\pi/6)$. [3 marks]

Reference angle $\pi/6$ in quadrant IV.

Answer: $-1/2,\ \sqrt{3}/2$

5. If $\cos\theta = -3/5$ in quadrant III, find sine and tangent. [3 marks]

$\sin^2\theta = 1 - 9/25 = 16/25$.

Select the negative sine; divide to obtain tangent.

Answer: $\sin\theta = -4/5,\ \tan\theta = 4/3$

6. Explain why $\tan(\pi/2)$ is undefined. [3 marks]

$\cos(\pi/2) = 0$; tangent is sine divided by cosine.

Answer: It would require division by zero.