Unit-circle meaning

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Give the exact unit-circle coordinates at 60°. [2 marks]

Coordinates are $(\cos 60^\circ, \sin 60^\circ)$.

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

2. Find sin 210° exactly. [2 marks]

210° is in quadrant III with reference angle 30°.

Sine is negative, so $\sin 210^\circ = -1/2$.

Answer: $-1/2$

3. Find cos 240° exactly. [2 marks]

The reference angle is 60° in quadrant III.

$\cos 240^\circ = -\cos 60^\circ = -1/2$.

Answer: $-1/2$

4. Find tan 135° exactly. [2 marks]

$\tan 135^\circ = (\sqrt{2}/2)/(-\sqrt{2}/2) = -1$.

Answer: -1

5. Do 45° and 765° identify the same unit-circle point? Explain. [2 marks]

765° − 45° = 720°, which is two complete turns.

Answer: Yes.

6. For a quadrant-II angle, cos θ = −3/5. Find sin θ and tan θ exactly. [3 marks]

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

Sine is positive in quadrant II.

$\tan\theta = (4/5)/(-3/5) = -4/3$.

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