Sine/cosine/tangent graphs

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. List zeros of $\sin x$ on $0 \le x \le 2\pi$. [3 marks]

Sine is zero at points on the horizontal axis.

Answer: $0, \pi, 2\pi$

2. Where does $\cos x$ attain -1 on $0 \le x \le 2\pi$? [3 marks]

The leftmost unit-circle point has horizontal coordinate -1.

Answer: $x = \pi$

3. State the range and period of $\sin x$. [3 marks]

Use the vertical extremes and the repeating cycle.

Answer: Range $[-1, 1]$; period 2π.

4. Give tangent asymptotes between $-\pi$ and π. [3 marks]

These are the odd half-pi values in the interval.

Answer: $x = -\frac{\pi}{2}, \frac{\pi}{2}$

5. Find all x with $\cos x = 0$ on $-\pi \le x \le \pi$. [3 marks]

Cosine vanishes at the vertical-axis points.

Answer: $x = \pm\frac{\pi}{2}$

6. Compare $\sin(x + 2\pi)$ with $\sin x$, and $\tan(x + \pi)$ with $\tan x$. [3 marks]

The added angles are whole periods of the corresponding functions.

Answer: They are equal respectively.