Consider the superposition of two traveling waves
1. $y_1 = A_0 \sin(k\,x - \omega\,t)$.
2. $y_2 = A_0 \sin(k\,x + \omega\,t)$.
The amplitude vanishes only at which of the following values of $k\,x$

A) $k\,x = \frac{\pi}{2}, \frac{3\,\pi}{2}, \frac{5\,\pi}{2}, ...$
B) $k\,x = \frac{\pi}{2}, \frac{5\,\pi}{2}, \frac{9\,\pi}{2}, ...$
C) $k\,x = 0, \pi, 2\,\pi, 3\,\pi, ...$
D) $k\,x = 0, 2\,\pi, 4\,\pi, ...$

Using

$$\sin\alpha + \sin\beta = 2\,\sin\frac{\alpha+\beta}{2}\,\cos\frac{\alpha-\beta}{2},$$

$$y = y_1 + y_2 = 2\,A_0\,\sin\,k\,x\,\cos\,\omega\,t\,.$$

The zeros of the amplitude function occurs at $k\,x = 0, \pi, 2\,\pi$ *etc.*
Answer **C**