

**Answer on Question #69286-Physics-Other**

Two collinear harmonic oscillations, having amplitudes 4 and 3 units, respectively, are superposed. Calculate the amplitude of the resultant oscillation, if their frequencies are equal but they have a phase difference of  $90^\circ$ .

**Solution**

The amplitude of the resultant oscillation is

$$A = \sqrt{A_1^2 + A_2^2 + 2A_1A_2 \cos \phi}$$

$$A = \sqrt{3^2 + 4^2 + 2(3)(4) \cos 90^\circ}$$

$$\cos 90^\circ = 0$$

Thus,

$$A = \sqrt{3^2 + 4^2} = 5 \text{ units.}$$

**Answer: 5 units.**

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