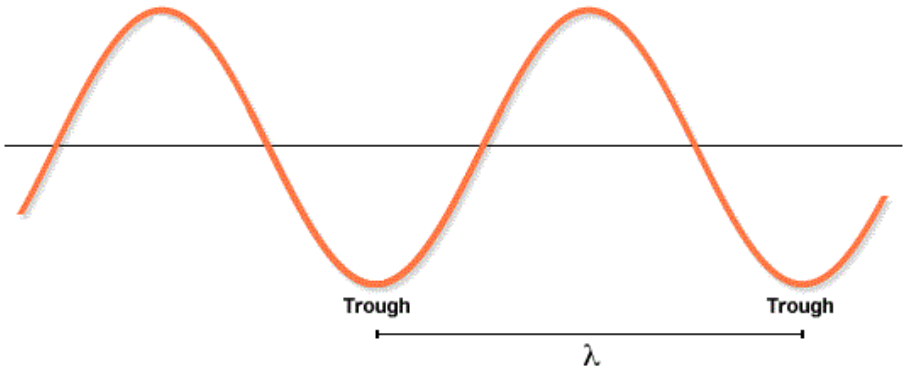
Answer on Question 54724, Physics, Mechanics

Question:

A source produces 400 waves every minute. If the speed of the waves is $8\,mm/s$, calculate the distance between adjacent troughs.

Solution:

The wavelength of the wave is the distance between adjacent troughs:



We can use the wave speed formula to find the wavelength:

$$v = f\lambda,$$

where, $v = 8\,mm/s = 0.008\,m/s$ is the speed of the waves, $f = 400/60s = 6.7Hz$ is the frequency and λ is the wavelength.

Thus, we can obtain:

$$\lambda = \frac{v}{f} = \frac{0.008\,m/s}{6.7Hz} = 1.2 \cdot 10^{-3}m.$$

Answer:

$\lambda = 1.2 \cdot 10^{-3}m.$