A transverse wave produced on a spring has a frequency of 190 Hz and travels along the length of the spring of 90 m, in 0.5 s.

(a) What is the period of the wave?

(b) What is the speed of the wave?

(c) What is the wavelength of the wave?

Solution:

Given:

$f = 190$ Hz,

$L = 90$ m,

$t = 0.5$ s,

(a) What is the period of the wave?

The period is

$$T = \frac{1}{f} = \frac{1}{190} = 0.0053 \text{ s}$$

(b) What is the speed of the wave?

The speed of the wave is:

$$v = \frac{\text{distance traveled}}{\text{time taken}} = \frac{L}{t} = \frac{90}{0.5} = 180 \text{ m/s}$$

(c) What is the wavelength of the wave?

The wavelength is

$$\lambda = vT = \frac{v}{f} = \frac{180}{190} \approx 0.95 \text{ m}$$