5. The velocity is determined from the tension, F, and the mass per unit length of the string, μ , as

$$v = \sqrt{F/\mu}$$

We were not given the mass per unit length of the string, but we know both the mass and the length of the string, so we can calculate the mass per unit length.

$$\mu = m/L = 0.20 \text{ kg} / 0.70 \text{ m}$$

$$\mu = 0.286 \text{ kg} / \text{m}$$

Now we can calculate the velocity of the wave in the string as

$$v = \sqrt{F/\mu}$$

where F is the force and μ is the mass per unit length of the string

$$v = \sqrt{(60N)/(0.286kg/m)}$$

$$v = \sqrt{209.8mN/kg}$$

$$v = 14.5 \text{ m} / \text{s}$$