$$\mu = \frac{m}{\ell}$$

1. Equation missing

2. $V = \sqrt{\frac{T}{\mu}}$

$$V^2 = \frac{T}{\mu}$$

$$T = \mu V^2$$

$$= \frac{mv^2}{\ell}$$

$$= \frac{0.06\,(50)^2}{5}$$

$$T = 30\ N$$

3. $\mu = \frac{T}{V^2}$

$$= \frac{6}{20^2}$$

$$\mu = 0.015$$

$$T = \mu V^2$$

$$= 0.015\,(30)^2$$

$$\mu = 13.5$$

4a. $y = y_m \sin(kx \pm \omega t + \emptyset)$

$y_m = 0.08$

$k = \dfrac{2\pi}{\lambda}$

$= \dfrac{2\pi}{0.8}$

$k = 7.85$

$\omega = 2\pi f$
$= 2\pi(3)$
$\omega = 18.8$

$y = 0.08 \sin(7.85x + 18.8t)$

b. $y = 0.08 \sin(7.85x + 18.8t + \emptyset)$
$y(0.1, 0) = 0$
$0 = 0.08 \sin(7.85(0.1) + \emptyset)$
$\sin(0.785 + \emptyset) = 0$
$0.785 + \emptyset = 0$
$\emptyset = -0.785$

$y = 0.08 \sin(7.85x + 18.8t - 0.785)$

5 a. 0.25 m

b. 40 rad/s

~~c. K = 2π~~
c. 0.3

d. $K = \dfrac{2\pi}{\lambda}$

$\lambda = \dfrac{2\pi}{0.3}$

$\lambda = 20.9$ m

e. $V = \dfrac{\omega}{K} = \dfrac{40}{0.3}$

$V = 133$ m/s

f. To the right

7. amplitude = 0.02 m

$K = \dfrac{2\pi}{\lambda}$

$\lambda = \dfrac{2\pi}{K}$

$= \dfrac{2\pi}{2.11}$

$\lambda = 3.0\ m$

$W = 2\pi f$

$f = \dfrac{3.62}{2\pi}$

~~f = 0.~~

$f = 0.576\ Hz$

$V = \dfrac{w}{K}$

$= \dfrac{3.62}{2.11}$

$V = 1.7\ m/s$

8. $y_m = 0.15$
   $K = 0.8$
   $W = 50$

a. $V = \dfrac{\omega}{K}$

   $= \dfrac{50}{0.8}$

   $V = 62.5 \, m/s$

b. $K = \dfrac{2\pi}{\lambda}$

   $\lambda = \dfrac{2\pi}{0.8}$

   $\lambda = 7.85 \, m$

c. $f = \dfrac{\omega}{2\pi}$

   $f = 7.96 \, rad/s$