

15: 26, 28, 61, 70

class 6

26: $I_1 4\pi r_1^2 = I_2 4\pi r_2^2$

\uparrow \uparrow \uparrow \uparrow
 11 7.5 1 ?

$r_2 = r_1 \sqrt{\frac{I_1}{I_2}} = 2.5m$

28: $A \cos(kx + \omega t)$

\uparrow \uparrow \uparrow
 2.3mm 6.48 742

← goes backward

$f = \frac{\omega}{2\pi} = 118 \text{ Hz}$

$\lambda = \frac{2\pi}{k} = .9 \text{ m}$

$v = \frac{\omega}{k} = 106 \text{ m/s}$

$v = \sqrt{\frac{T}{\mu}}$

\uparrow \uparrow
 .00338 1.35

$P = \frac{1}{2} A^2 k \omega = 3.85 \text{ W}$

$v^2 \mu = T = 281 \text{ N}$

61: 2nd overtone \Rightarrow 3rd harmonic $\Rightarrow L = \frac{3}{2} \lambda = 3(6.28) = 18.8 \text{ cm}$

node-node = $\frac{\lambda}{2}$

max \rightarrow min = $\frac{1}{2} T = 8.4 \text{ ms} \Rightarrow f = \frac{1}{2 \cdot 8.4 \text{ ms}} = 59.5 \text{ Hz}$

$v = f \lambda = f(2 \cdot 6.28) = 74 \text{ m/s} = 7.4 \text{ cm/s}$

$\mu = \frac{T}{v^2} = \frac{5}{74.8^2} = 8.95 \times 10^{-2} \frac{\text{kg}}{\text{m}}$

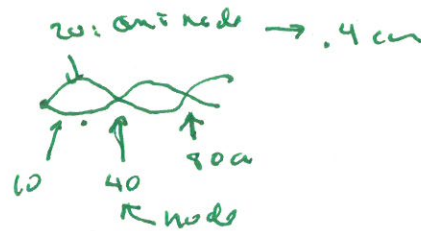
$m = \mu L = 1.68 \times 10^{-2} \text{ kg} = 16.8 \text{ g}$

$v = 192$
 $f = 240 \text{ Hz}$

70: $\lambda = \frac{v}{f} = .8 \text{ m} = 80 \text{ cm}$

$A \sin\left(\frac{2\pi}{\lambda} x\right) \sin(\omega t)$

\uparrow
4 cm



at $x = 10 \text{ cm}$ $A \sin\left(\frac{2\pi}{\lambda} x\right) = .4 \sin\left(\frac{2\pi}{8}\right) = .4 \sin(45^\circ) = .283 \text{ cm}$

all parts: $\frac{T}{2} = \frac{1/240}{2} = 2.08 \text{ ms}$

40 cm \rightarrow node $\rightarrow v \ \& \ a = 0$

20 cm \rightarrow anti node $v_{\text{max}} = A\omega = 603 \frac{\text{cm}}{\text{s}}$

$a_{\text{max}} = A\omega^2 = 9.00 \times 10^5 \frac{\text{cm}}{\text{s}^2}$

10 cm $\rightarrow A \rightarrow A/\sqrt{2}$ divide about by $\sqrt{2}$