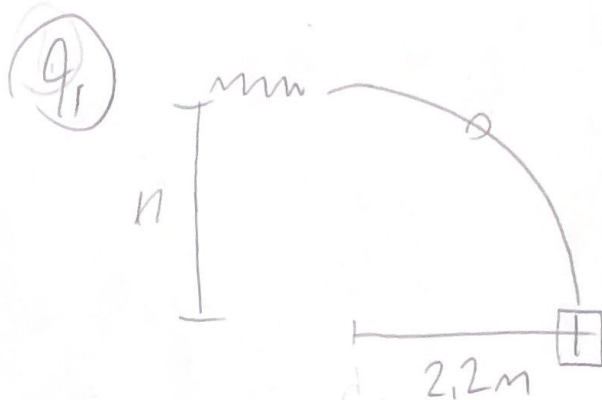


Carson Hicks SHOW WORK



$$V_{01} = \frac{V_{02}}{V_{01}} = \frac{D}{D_1} \rightarrow V_{02} = \frac{D}{D_1} V_{01}$$

$V_{02} =$

$$\frac{1}{2} m V_0^2 = \frac{1}{2} k l^2$$

$$V_{02} = \left(\frac{D_2}{D_1}\right) V_{01} \quad l_2 = \frac{D}{D_1} = \frac{2.21m / (1.16cm)}{1.95m} = \boxed{1.13cm}$$

-2

10.

B.  $\frac{1}{2} I \omega^2 = mgy - \frac{1}{2} m v^2$

42.27



$$R = .2m$$

$$M = 2kg$$

$$\theta = 30^\circ$$

$$g = 10 \frac{m}{s^2}$$

$$W =$$

$$I = \frac{1}{2} M R^2$$

$$r = 3m$$

$$I = 15(2)(.2)^2$$

$$I = 1.2$$

$$\frac{1}{2} m v^2 + \frac{1}{2} I \omega^2 = mgy$$

$$15(2)^2 + 15(2)^2 = (2)(10)(3)$$

$$v^2 + 1.2 v^2 = 60$$

$$mgy - mgy$$

$$20(2) \sin 30 - (2)(2) \sqrt{}$$

$$10 - 20 = 0.25 \sqrt{}$$

a.

linear acceleration =  $1.43 \frac{m}{s^2}$

linear acceleration =  $\frac{Mg \sin \theta}{M + \frac{1}{2} M R^2 / r^2}$

Carson Hicks

11. a.  $PV = nRT$   $\frac{PV}{T} = \frac{P'V'}{T'}$

$$\frac{1}{300} = \frac{4}{T'}$$

$$T_B = 1200K$$

$$\frac{2}{1200} = \frac{1.5}{T'} = \frac{2T'}{1200} = 1.5$$

$$T_A = 300K$$

b.  $W = \int P \cdot dV$

$$W_a = 600J$$

$$W_b = 0J$$

$$W_c = 277.17J$$

c.  $E_{intAB} = 1399.4J$

$$E_{intBC} = 299.9J$$

$$E_{intCD} = 0J$$

d.  $Q_{AB} = 1999.4J$

$$Q_{BC} = 299.9J$$

$$Q_{CD} = 277.17J$$

e.

$$1 - \frac{Q_c}{Q_h} = 1 - \frac{T_c}{T_h} = 1 - \frac{300}{500} = 1 - 0.6 = 0.4$$

$$\approx 40\%$$

12.

a.  $\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}} = 1.048$

$$L, U' = \frac{U - v}{1 - \frac{uv}{c^2}}$$

$$-16$$

$$37.73 \text{ years}$$

b.  $\frac{10.8}{13} = 36 \text{ years}$