

$$\text{S.A. } 5 @ 2 = 10$$

$$10 \text{ probs } @ 9 = \underline{90}$$

3- Collision

4 { Energy - KE, PE_g, PE_c
Work/Energy

1- Power

1- Pulleys

p162 #20

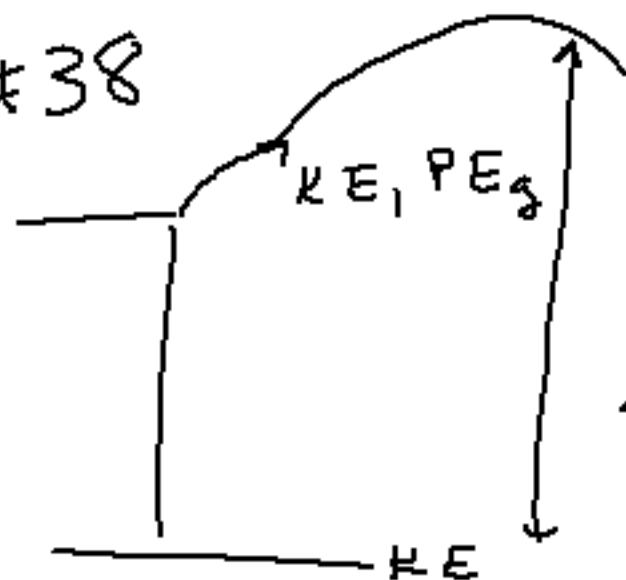
$$W = K E$$

$$F d = \frac{1}{2} m v^2$$

$$F(.25) = \frac{1}{2} (.140) 32^2$$

$$F = 287 \text{ N}$$

#38



$$\frac{1}{2}m(185)^2 + m(9.8)265 = \frac{1}{2}mv^2$$

$$v = 199 \text{ m/s}$$

of velocity with which hits ground is 150 m/s, how much energy is lost in heat? mass of ball is 1.00 kg.

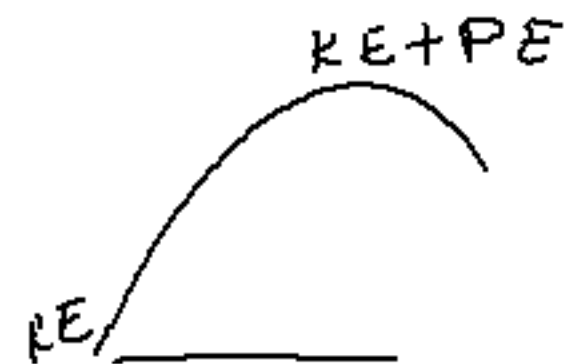
$$KE + PE = \frac{1}{2}(1)(185)^2 + 1(9.8)265 = 19709.5$$

$$\begin{array}{r} 19709.5 \\ - 11250 \\ \hline \end{array}$$

$$KE = \frac{1}{2}(1)(150^2) = 11250$$

$$8459.5 \text{ J}$$

#74



$$\frac{1}{2} m v^2 = m(9.8)(1.1) + \frac{1}{2} m (6.5)^2$$

$$v = 7.99 \text{ m/s}$$

#87

$$P = \frac{W}{t} = \frac{Fd}{t} = \frac{72(9.8)5}{9}$$

$$= 392 \text{ W}$$

What power is needed to accelerate
a car from 0 to 30.0 m/s in 10.0 sec?

1500 kg

$$W = KE = \frac{1}{2} (1500) 30^2$$

$$P = \frac{W}{t} = \frac{675000}{10}$$

$$= 67,500 \text{ W}$$

$$90.5 \text{ hp}$$

#72



$$8 \frac{\text{km}}{\text{hr}} = 2.224 \frac{\text{m}}{\text{s}}$$


$$\frac{1}{2} m v^2 = \frac{1}{2} k x^2$$

$$\frac{1}{2} (1300) (2.224)^2 = \frac{1}{2} k (.015)^2$$

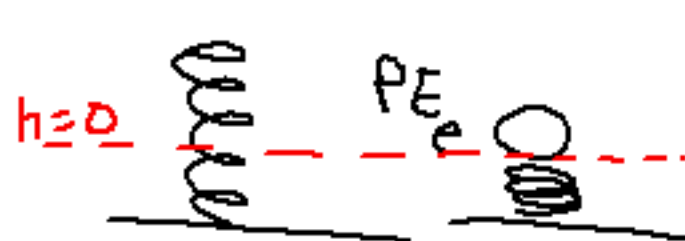
$$k = 28577906$$

$$k = 2.86 \times 10^7 \text{ N/m}$$

A 3.00 kg ball is dropped from a height of 1.50 m above top of a vertical spring. If spring compresses .300 m, find the spring constant.

PE_g 

OR 



$$3(9.8)(1.8) = \frac{1}{2}k(.3)^2$$

$$k = 1176 \text{ N/m}$$



$$3(9.8)(1.5) = \frac{1}{2}k(.3^2) + 3(9.8)(-.3)$$

$$k = 1176 \text{ N/m}$$

P 188 # 8

$$9300(15) + m(0) = (9300 + m)6$$

$$\text{or } 9300(6) + m(6)$$

$$m = 1.4 \times 10^4 \text{ kg}$$

$$m = 13,950 \text{ kg}$$

#23

$$.45(3) + .9(0) = .45v_1 + .9v_2$$

$$1.35 = .45v_1 + .9(3+v_1)$$

$$1.35 = .45v_1 + 2.7 + .9v_1$$

$$-1.35 = 1.35v_1$$

$$-1 = v_1$$

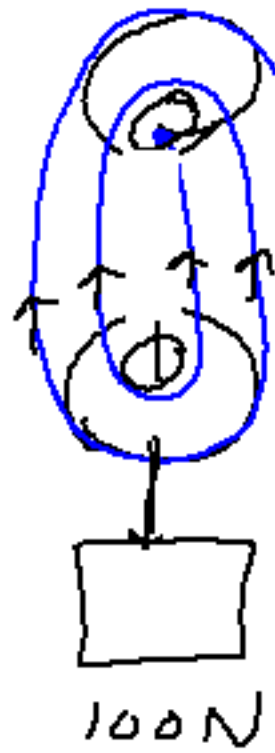
$$3 - 0 = v_2 - v_1$$

$$3 + v_1 = v_2$$

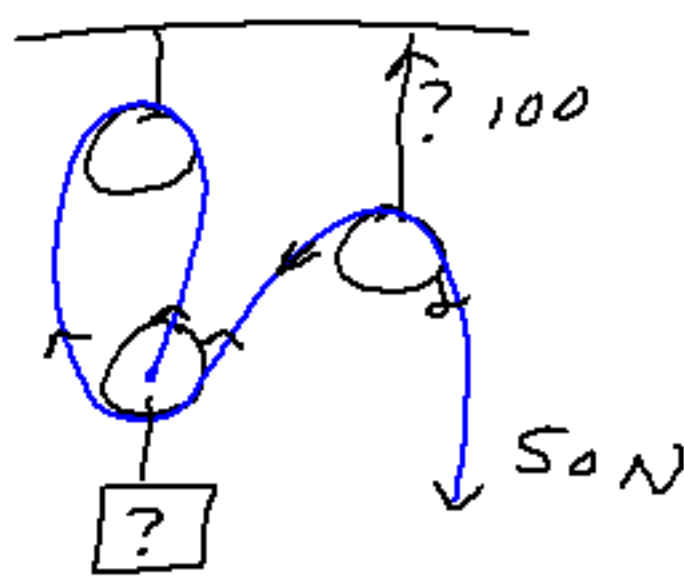
$$v_2 = 3 + -1 = 2$$

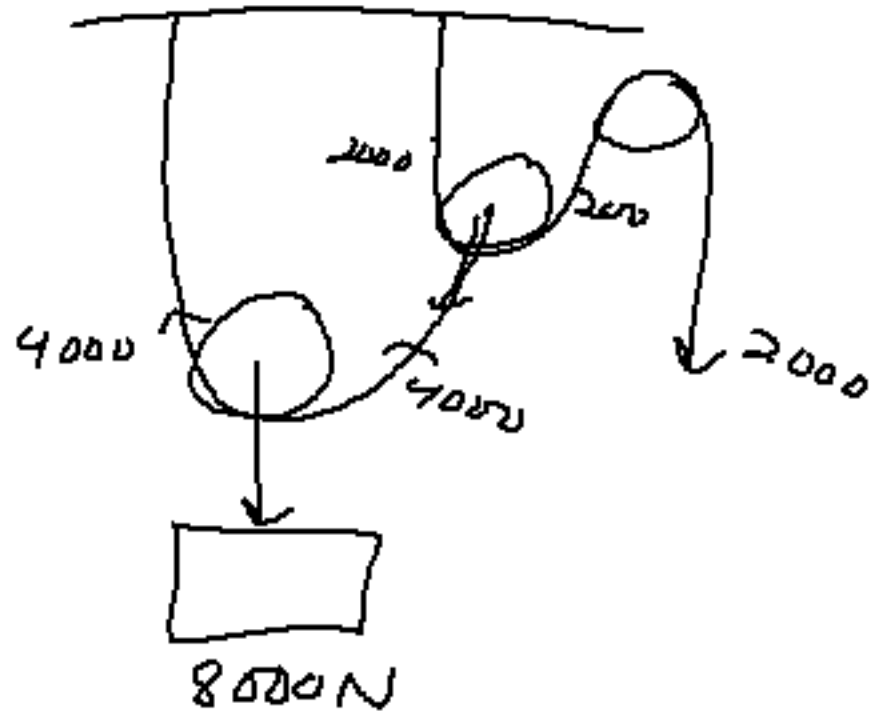
.45 kg ball 1 m/s west.

.9 kg ball 2 m/s east.



F? 25 150N







throw ball down with speed of
3.00 m/s from ht of 2.00 m
above top of spring. If
spring constant is 775 N/m
and it compresses .200 m,
find mass of ball.



$$KE + PE_g = PE_e$$

$$\frac{1}{2}m(3)^2 + m(9.8)(2.2) = \frac{1}{2}(775)(.2)^2$$

$$m = .595 \text{ kg}$$

p162

#18, 78, 83, 93

p188

#26