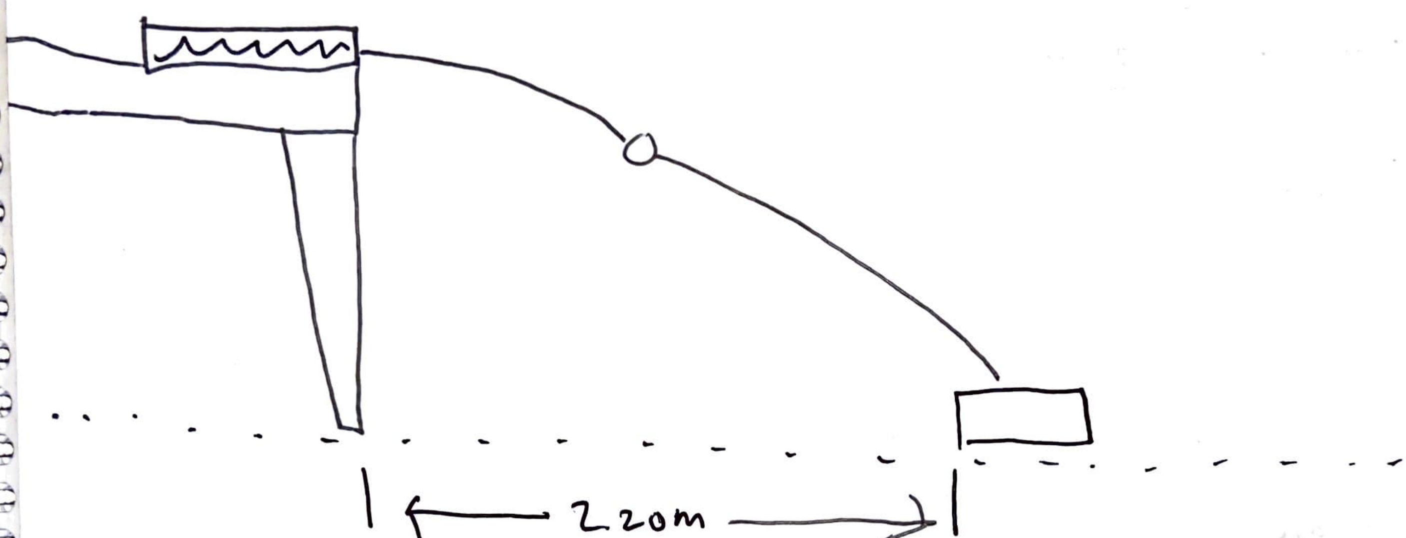
Clay H.

Qustion 9.



ΔX 2.2m
Vi
Vf
a 0
t

ΔY
Vi 0
Vf
a 10m/s2
t

$f_{spring} = -kx$

$ke_i + pe_i = ke_f + pe_f$
0 0

$-k\,1.1 = f_{spring}$

$pe_i = ke_f$

F = ma

$ke_i + pe_i = ke_f + pe_f$

.27 cm = .27m

2.2 - .27 = 1.93

$-k1.1 = ma$

$ke_i = ke_f$

~~-k = kf~~

$\frac{1}{2}mv^2 = \frac{1}{2}mv^2$

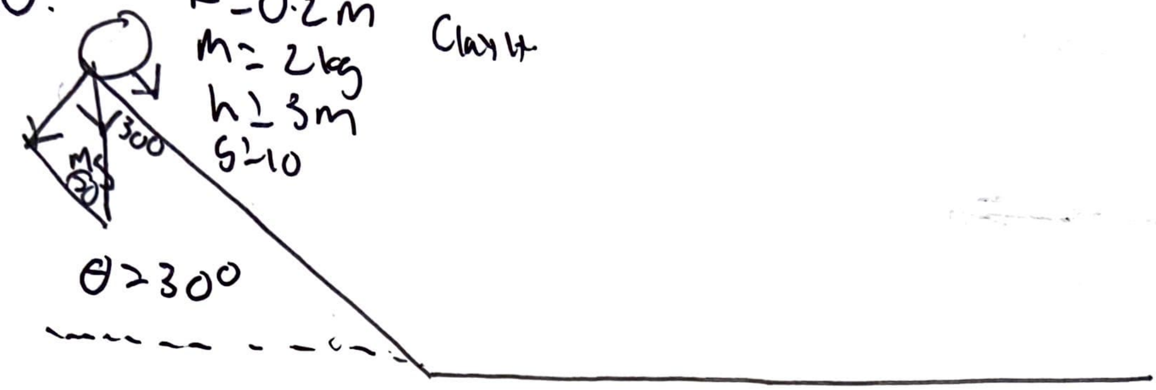
$\Delta X = 1.93$
Vi
Vf
a 0
t

$-k = \frac{ma}{1.1}$

$\frac{1}{2}v_i^2 = \frac{1}{2}v_f^2$

1.21 cm

10.



$R = 0.2\,m$
$m = 2\,kg$
$h = 3\,m$
$g = 10$

Class 4

$\theta = 30^\circ$

$I = mr^2$

$\sin 30 = \frac{a}{h}$
$h \sin 30 = a$

$ke_{rotational} + ke_{linear} = ke_{total}$

$\sin 30 = \frac{mg}{h}$

$\frac{1}{2} I w^2 + \frac{1}{2} m v^2$

$h \sin 30 = mg$

$\frac{1}{2}(2 \cdot .04) \quad \frac{1}{2}\, 2\,kg$

$\frac{mg}{\sin 30} = h$

$\frac{1}{2} .08 w^2 = \frac{1}{2} 2 v^2$

$\frac{2_{kg} \cdot 10\,m/s^2}{\sin 30}$

~~.04~~ $= .04 w^2 = v^2$

$\frac{20\,N}{\sin 30}$

~~$F_h = 40N$~~
$F = 40N$

$40N = ma$
$40N = 2a$
$20 = a$

$ke_i + pe_i = ke_f + pe_f$
~~$0 + pe_i = ke_f + pe_f$~~

~~A~~ = $a = 20\,m/s^2$

$mgh = \frac{1}{2} m v^2$

$\sqrt{\frac{30}{.04}} = w$

$30\,J$

$2\,kg \cdot 10\,m/s^2 \cdot 3\,m = \frac{1}{2} m v^2$

$30\,J = \frac{1}{2} 2 v^2$

3~~00~~

$30\,J = v^2$

$\sqrt{30} = v$

$\frac{30}{.04} = w^2$

Class 4

11.

A. ~~[redacted]~~

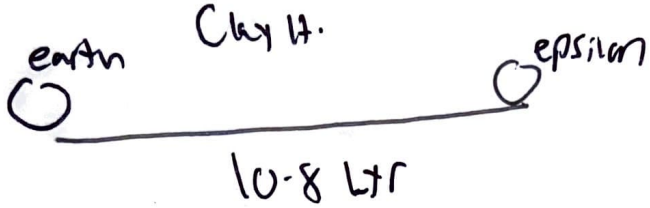
B.

C.

D.

E.

12.



$V = 0.3c$

10.8 ltr

$10.8 \times 1\frac{1}{3}$

$10.8 \times 3.3 = 35.64 \text{ ltr}$