PCLM Exercise 4B

SUVAT

$v = u + at$

$s = ut + \frac{1}{2}at^2$

$s = vt - \frac{1}{2}at^2$

$v^2 = u^2 + 2as$

$s = \frac{(v+u)}{2}t$

7)

$t=2$

$v = u + at$

$v = 0 + 9.8 \times 2$

$v = 19.6 \text{ ms}^{-1}$

1s 1s

up

$v = u + at$

At top $v = 0$

$0 = u - 9.8 \times 1$

$u = 9.8 \text{ ms}^{-1}$

$e = \frac{\text{speed of sep}}{\text{speed of app}}$

$= \frac{9.8}{19.6} = \frac{1}{2}$

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9)

h

$\frac{h}{2}$

Down $v^2 = u^2 + 2as$

$v^2 = 0 + 19.6h$

up $v^2 = u^2 + 2as$

top $v=0$ $0 = u^2 - 2g \times \frac{h}{2}$

$gh = u^2$

$u = \sqrt{gh}$

$$s = ut + \frac{1}{2}at^2$$

$t = 1$

$$s = \sqrt{gh} \times 1 - \frac{g}{2} \times 1^2$$

$$s = \sqrt{gh} - \frac{g}{2}$$

Kinetic Energy

KE is energy a body has due to its motion

$$K.E. = \frac{1}{2}mv^2 \quad \text{Joules}$$

Gravitational Potential Energy (GPE) is energy a body has due to its position above an arbitrary reference point

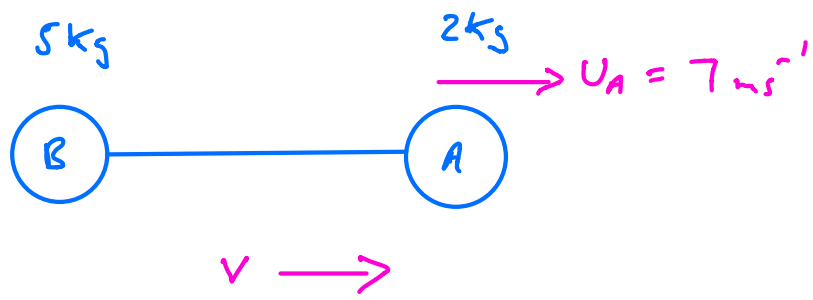
$$GPE = mgh \quad \text{Joules}$$

where h is distance above the reference level

Exercise 4C

11)

a)



PCLM $\quad 2 \times 7 = 7v$

$$v = 2ms^{-1}$$

b) KE loss $= \frac{1}{2} m_A u_A^2 - \frac{1}{2}(m_A + m_B) v^2$

$= \frac{1}{2} \times 2 \times 7^2 - \frac{1}{2}(2+5) \times 2^2$

$= 49 - 14$

$= 35$ Joules

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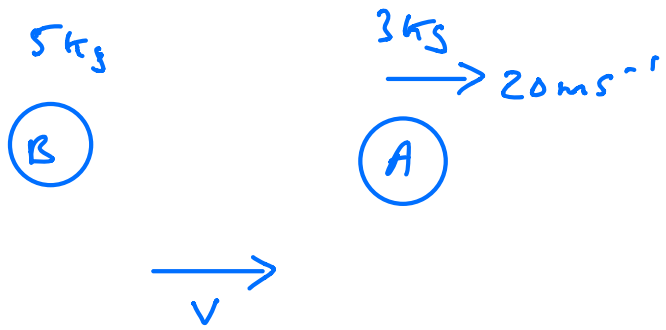
13)



PCLM $3 \times 20 = (5+3)v$

$\frac{60}{8} = v$

$v = 7.5 \text{ ms}^{-1}$

Loss in KE $\frac{1}{2} \times 3 \times 20^2 - \frac{1}{2} \times 8 \times 7.5^2$

$600 - 225$

$= 375$ J

Classwork + Hwk

Exercise 4B Q6, Q8

4C Q8, Q10, Q12, Q14