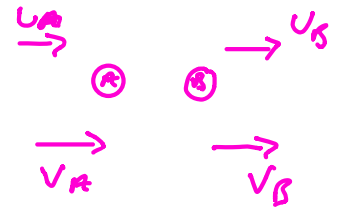
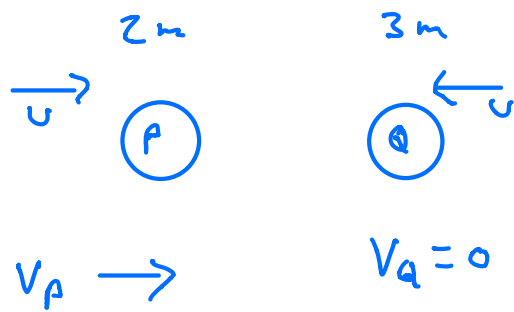


Exercise 4A

5)



PCLM

$$2mu - 3mu = 2mV_P$$

$$\frac{-mU}{2m} = V_P$$

$$\underline{V_P = -\frac{U}{2}}$$

Speed of P = $\frac{U}{2}$ (direction reversed)

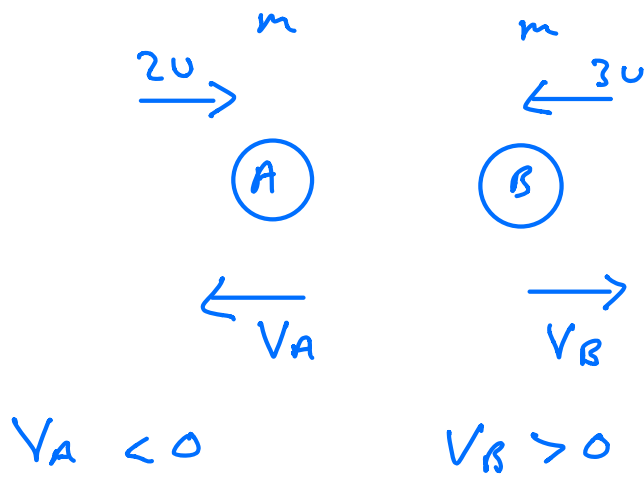
$$e = \frac{\text{speed of separation}}{\text{speed of approach}}$$

$$e = \frac{V_B - V_A}{U_A - U_B}$$

$$e = \frac{0 - V_P}{U - -U} = \frac{0 - -\frac{U}{2}}{2U}$$

$$e = \frac{1}{4}$$

7)



PCLM $2mu - 3mu = -mV_A + mV_B$
 $-u = -V_A + V_B$

Restitution $e = \frac{V_A + V_B}{2u + 3u}$

$$\int ue = V_A + V_B \quad (2)$$

$$-u = -V_A + V_B \quad (1)$$

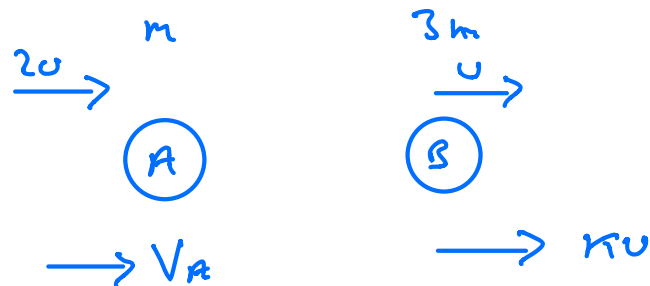
Add $(5e-1)u = 2V_B$

$$V_B > 0 \quad \therefore 5e-1 > 0$$

$$5e > 1$$

$$e > \frac{1}{5}$$

a)



PCLM

$$2mu + 3mu = 3mku + mV_A$$

$$2u + 3u = 3ku + V_A$$

$$5u - 3ku = V_A$$

$$V_A = (5 - 3k)u$$

a)

b) Restitution $e = \frac{\text{speed of sep}}{\text{speed of approach}}$

$$e = \frac{ku - V_A}{u}$$

$$e = \frac{ku - (5 - 3k)u}{u}$$

$$e = k - (5 - 3k)$$

$$e = 4k - 5$$

$$0 \leq e \leq 1$$

$$0 \leq 4k - 5 \leq 1$$

$$0 + 5 \leq 4k \leq 1 + 5$$

$$5 \leq 4k \leq 6$$

$$\frac{5}{4} \leq k \leq \frac{6}{4}$$

Classwork + Hwk Ex 4A Q4, 6, 8, 10