

5

	mass	vel before	vel after
P	4	u	v
Q	2	2	3

(i) PCM $4u + 2(2) = 4v + 2(3)$ 5, 5

$$2u - 2v = 1 \quad \dots\dots\dots \text{eq(i)}$$

NEL $v - 3 = -0.5(u - 2)$ 5

$$u + 2v = 8 \quad \dots\dots\dots \text{eq(ii)}$$

Add equations (i) and (ii)

$$3u = 9$$

$$u = 3 \text{ m/s} \quad 5 \quad 20$$

(ii) Impulse = change in momentum

$$= 2(3 - 2) \quad 5$$

$$= 2 \quad 5 \quad 10$$

(iii) From eq(i) $v = 2.5 \text{ m/s}$ 5

$$\text{KE before} = 0.5(4)(9) + 0.5(2)(4) = 22.0 \quad 5$$

$$\text{KE after} = 0.5(4)(6.25) + 0.5(2)(9) = 21.5 \quad 5$$

$$\Rightarrow \text{Loss in KE} = 0.5 \text{ J} \quad 5 \quad 20$$