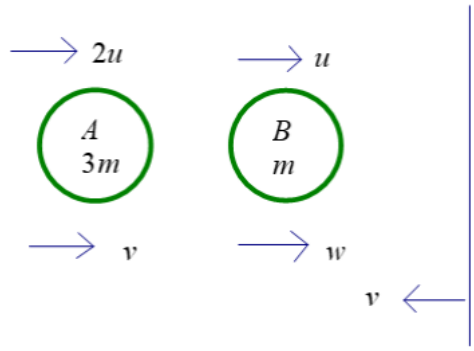
| Question Number | Solution | Marks | Notes |
|---|---|---|---|
| 7 |  | | |
| 7a | KE gain = final KE – initial KE | M1 | KE equation for *B*.<br>Allow for change in KE |
| | $\frac{48}{25}mu^2 = \frac{1}{2}mw^2 - \frac{1}{2}mu^2$ | A1 | Correct unsimplified equation to find *w* |
| | $\left(w^2 = \frac{121}{25}u^2, \quad w = \frac{11}{5}u\right)$ | | |
| | CLM: $3m \times 2u + mu = 3mv + mw$ | M1 | All terms required. Condone sign errors |
| | $\left(7mu = 3mv + \frac{11}{5}mu\right) \left(v = \frac{8}{5}u\right)$ | A1 | Correct unsimplified equation in *v* and *w* or their *w* |
| | Impact law: | M1 | Used correctly |
| | $w - v = e(2u - u)$ | A1 | Correct unsimplified equation in *v* and *w* or their *v* and *w* |
| | Solve for *e* | DM1 | Dependent on the preceding M marks |
| | $\frac{3}{5}u = eu, \quad e = \frac{3}{5}$ | A1 | |
| | | **(8)** | |
| 7b | Impact law: $fw = v$ | M1 | Condone sign error |
| | $f = \frac{8}{11}$ | A1 | 0.73 or better<br>Final answer must be positive |
| | | **(2)** | |
| | | **[10]** | |