

TOPIC 5 FURTHER MECHANICS

5A Further momentum

| Question number | Answer | Additional guidance | Mark |
|-----------------|--------|---|------|
| 1 | B | Note that while D can be true in some circumstances, it is not true if the vehicles' speeds were different initially. | (1) |

(Total for Question 1 = 1 mark)

| Question number | Answer | Additional guidance | Mark |
|-----------------|--|---|------|
| 2(a) | $250 \times 2.4 = 600$ (1) kg m s^{-1} (1) | Do not allow kg m/s. | (2) |
| 2(b) | Momentum decrease (1) Change in momentum of probe = (-)change in momentum of gas (in opposite direction) (1) Gas momentum change is 'forwards' so probe change is 'backwards'. (1) | An answer in terms of Newton's third law should be credited, provided students relate it to momentum and velocity. Allow sum of momentum <u>change</u> = 0 Do not allow <u>total</u> momentum = 0 | (3) |
| 2(c) | $Ft = \Delta p$ $F = \frac{600}{20}$ (1) $F = 30 \text{ N}$ (1) | Allow error carried forward from 2(a). | (2) |
| 2(d) | Average mass of probe will be lower. (1) As momentum change is the same, $\Delta v = \frac{\Delta p}{m}$ will be greater. (1) | | (2) |
| 2(e)(i) | Momentum change of probe would double. (1) Momentum change of gas = Δmv (for the same mass): double v , Δp will double. (1) | | (2) |

Ial Physics Mark Scheme

S Ben Porath

A red circular graphic with a gradient, appearing as a stylized arrow or a partial circle, located to the right of the author's name.

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