Answer **all** the questions in the spaces provided.

1 Particle A of mass $9m$ and particle B of mass m travel towards each other along a smooth horizontal surface in a straight line and collide head-on. The initial speed of particle A before the collision is u.

In Fig. 1.1, the variation with time t of momentum p is shown from $t = 0$ to $t = 3T$ for particle A and from $t = 0$ to $t = T$ for particle B.

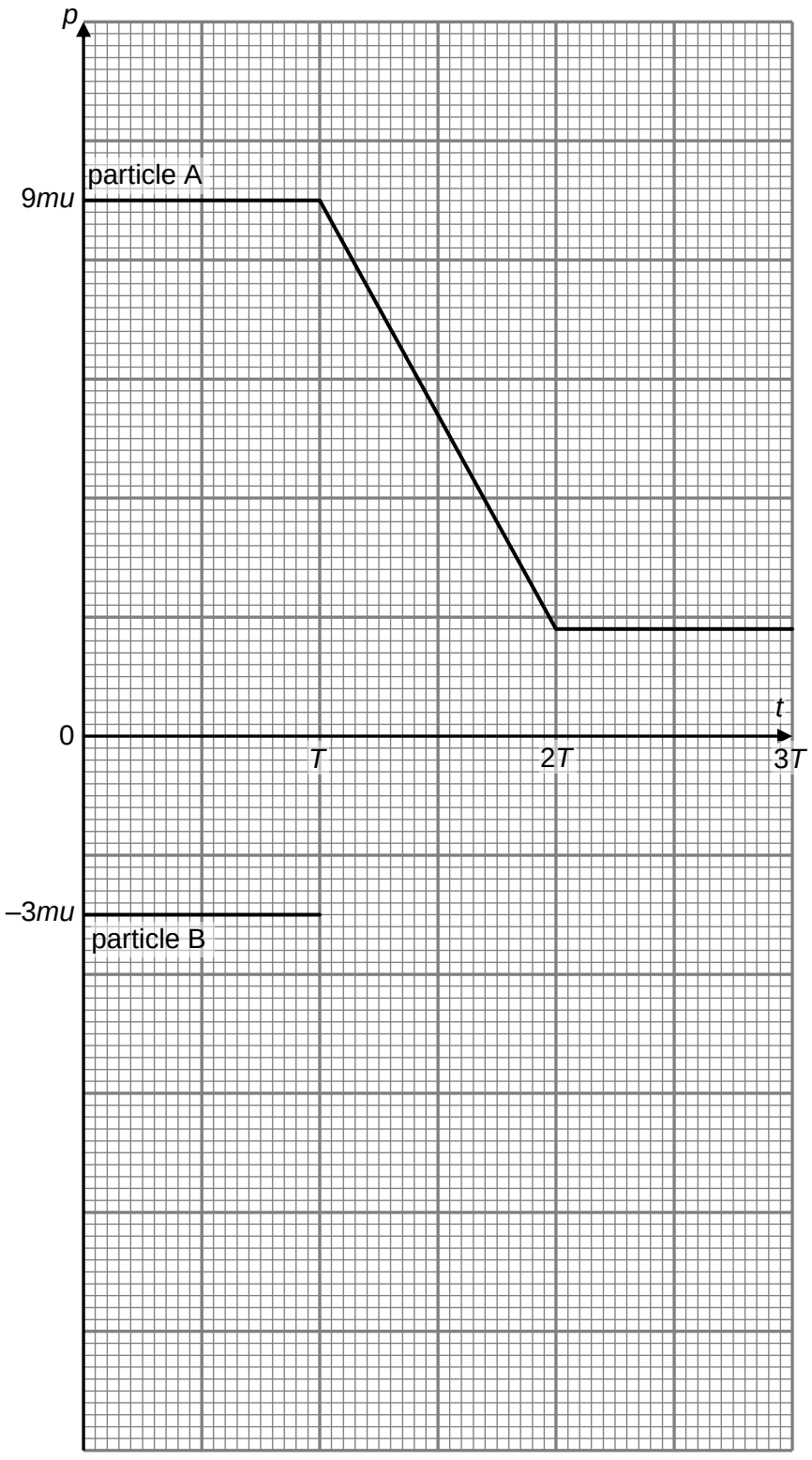

Fig. 1.1

(a) **(i)** On Fig. 1.1, draw the variation with t of p from $t = T$ to $t = 3T$ for particle B. [1]

(ii) Explain how the principle of conservation of momentum is used to complete the graph in **(a)(i)**.

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..... [2]

(b) Explain, with appropriate working, whether the collision between particles A and B is elastic.

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..... [3]

(c) Using Fig. 1.1, explain how the graphs are consistent with Newton's third law of motion during the collision.

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..... [3]