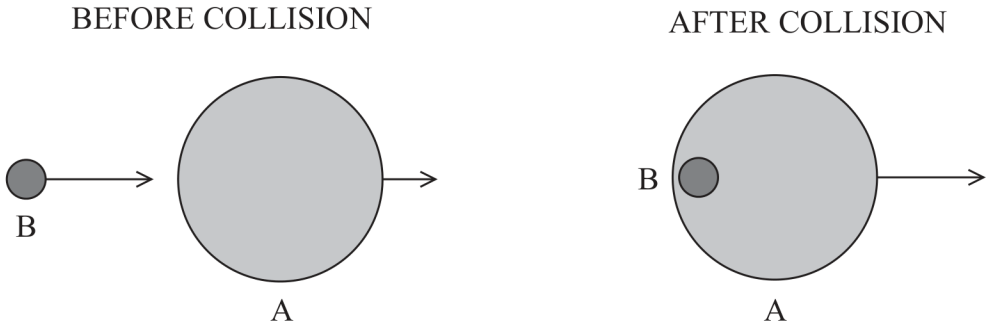
SECTION B

Answer ALL questions in the spaces provided.

11 A slow moving asteroid A was hit by a faster asteroid B. Asteroid B was absorbed by asteroid A as shown.



(a) State the principle of conservation of linear momentum.

(2)

(b) Before the collision, asteroid A had a velocity of $2.19 \times 10^{3}\,m\,s^{-1}$ and a momentum of $1.80 \times 10^{17}\,kg\,m\,s^{-1}$.

(i) Show that the mass of asteroid A was about $8.2 \times 10^{13}\,kg$.

(2)

(ii) Calculate the velocity of the asteroids after the collision.

mass of asteroid B = 5.90×10^{12} kg
velocity of asteroid B before the collision = 15.0×10^{3} m s^{-1}

(3)

Velocity of asteroids = ...

(Total for Question 11 = 7 marks)