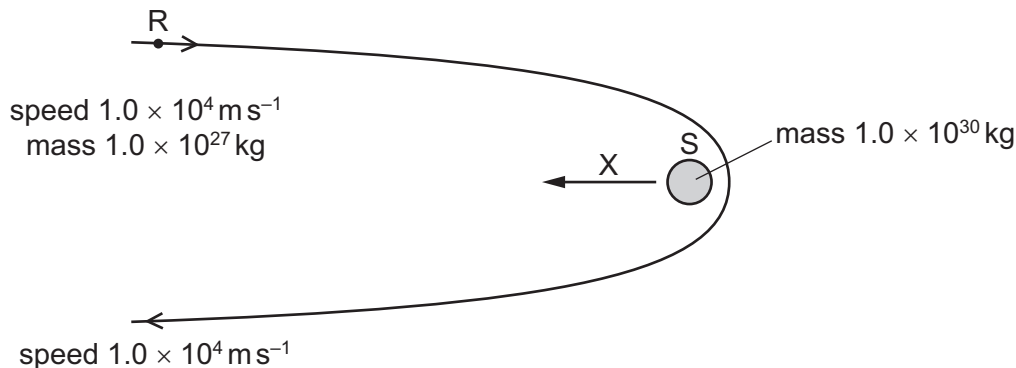


- 9 A rock R of mass  $1.0 \times 10^{27}$  kg is a large distance from a star S and is travelling at a speed of  $1.0 \times 10^4$  m s<sup>-1</sup>. The star has mass  $1.0 \times 10^{30}$  kg. The rock travels around the star on the path shown so that it reverses its direction of motion and, when finally again a large distance from the star, has the same speed as initially.



Which statement is correct?

- A The change in the momentum of S is in the direction of arrow X.
- B The change in the velocity of S is approximately  $20 \text{ m s}^{-1}$ .
- C The magnitude of the change of momentum of R is  $10^3$  times greater than the magnitude of the change of momentum of S.
- D The momentum of R does not change.