

**12** Spheres X and Y form an isolated system. The mass of Y is greater than the mass of X.

Sphere Y is initially stationary.

Sphere X collides elastically with sphere Y.

The speed of sphere X before the collision is  $u$ .

Which statement **must** be correct?

- A** Sphere X rebounds with a speed that is greater than  $u$ , and sphere Y moves off with a speed that is less than  $u$ .
- B** Sphere X rebounds with a speed that is less than  $u$ , and sphere Y moves off with a speed that is also less than  $u$ .
- C** Sphere X rebounds with speed  $u$ , and sphere Y remains stationary.
- D** Sphere X remains stationary, and sphere Y moves off with a speed that is less than  $u$ .