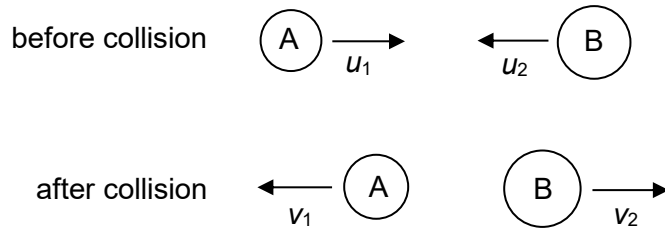**4** Two spheres, A and B, are moving towards each other at speeds u_1 and u_2 respectively and make a head-on elastic collision. After the collision, A and B move off with speeds v_1 and v_2 respectively, as shown.

u_1 is more than u_2 and v_2 is more than v_1.

before collision $\quad$ (A) $\xrightarrow{\quad} \atop u_1$ $\qquad$ $\xleftarrow{\quad} \atop u_2$ (B)

after collision $\quad$ $\xleftarrow{\quad} \atop v_1$ (A) $\qquad$ (B) $\xrightarrow{\quad} \atop v_2$

What is the correct expression that equates the relative speed of approach to the relative speed of separation?

A $\quad u_1 + u_2 = v_1 + v_2$

B $\quad u_1 + u_2 = v_2 - v_1$

C $\quad u_1 - u_2 = v_1 + v_2$

D $\quad u_1 - u_2 = v_2 - v_1$