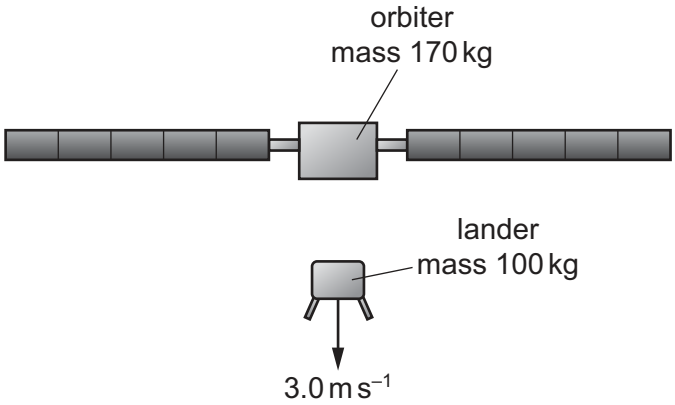
9 The space probe Rosetta was designed to investigate a comet. The probe consisted of an orbiter and a lander. The orbiter had a mass of 170 kg and the lander had a mass of 100 kg. When the two parts separated, the lander was pushed towards the surface of the comet so that its change in velocity towards the comet was $3.0\,m\,s^{-1}$.



Assume that the orbiter and lander were an isolated system.

The orbiter moved away from the comet during the separation.

What was the change in the speed of the orbiter?

A $1.8\,m\,s^{-1}$ **B** $2.3\,m\,s^{-1}$ **C** $3.0\,m\,s^{-1}$ **D** $5.1\,m\,s^{-1}$