

8 A line in the hydrogen spectrum of a star in the Milky Way galaxy is observed to have a wavelength of 656.3 nm. In a laboratory on Earth this line has a wavelength of 654.9 nm.

Which of the following expressions gives the magnitude of the velocity of the star relative to Earth?

☐ A  $\frac{656.3}{654.9} \times 3 \times 10^8 \text{ m s}^{-1}$

☐ B  $\frac{654.9}{(656.3 - 654.9)} \times 3 \times 10^8 \text{ m s}^{-1}$

☐ C  $\frac{654.9}{656.3} \times 3 \times 10^8 \text{ m s}^{-1}$

☐ D  $\frac{(656.3 - 654.9)}{654.9} \times 3 \times 10^8 \text{ m s}^{-1}$

(Total for Question 8 = 1 mark)