

Answer **all** the questions in the space provided.

- 1 (a) State what is meant by a *random error*?

.....
..... [1]

- (b) A ship at sea is travelling with a velocity of 13 m s^{-1} in a direction 35° east of north in still water, as shown in Fig. 1.1.

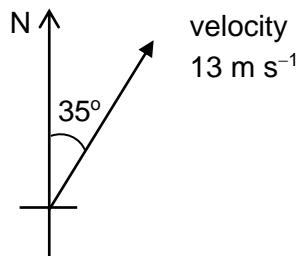


Fig. 1.1

- (i) Calculate the north component of the ship's velocity.

north component of velocity = m s^{-1} [1]

- (ii) The ship's velocity is measured with an uncertainty of $\pm 10\%$. Its direction is measured with an uncertainty of $\pm 1^\circ$.

Determine the north component of the velocity with its associated uncertainty.

north component of velocity = \pm m s^{-1} [3]