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

1 **(a)** The spacing between two atoms in a crystal is 3.8×10^{-10} m. State this distance in pm.

spacing = ... pm [1]

(b) Calculate the time of one day in Ms.

time = ... Ms [1]

(c) The distance from the Earth to the Sun is 0.15 Tm. Calculate the time in minutes for light to travel from the Sun to the Earth.
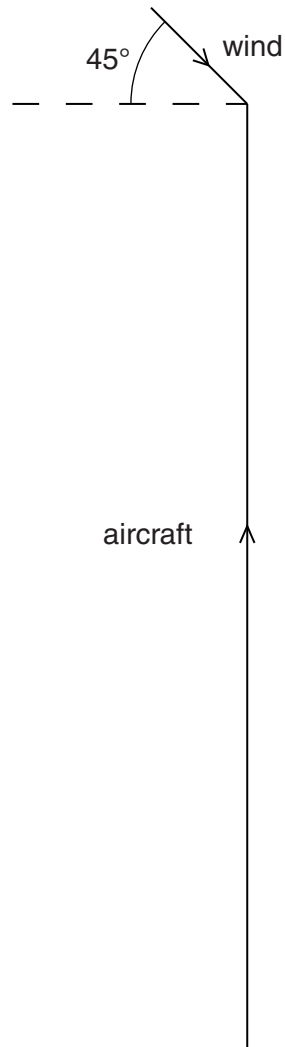
time = ... min [2]

(d) Underline all the vector quantities in the list below.

distance   energy   momentum   weight   work   [1]

(e) The velocity vector diagram for an aircraft heading due north is shown to scale in Fig. 1.1. There is a wind blowing from the north-west.

Fig. 1.1

The speed of the wind is $36\,m\,s^{-1}$ and the speed of the aircraft is $250\,m\,s^{-1}$.

(i) Draw an arrow on Fig. 1.1 to show the direction of the resultant velocity of the aircraft. [1]

(ii) Determine the magnitude of the resultant velocity of the aircraft.

resultant velocity = ... $m\,s^{-1}$ [2]