1   What is essential when recording a measurement of a physical quantity?

   A   the measurement has an SI unit

   B   the measurement has a unit and a number

   C   the measurement has a unit given as a base unit

   D   the measurement is from an analogue scale

2   The mobility μ of electrons travelling through a metal conductor can be calculated using the equation

$$\mu = \left(\frac{e}{m}\right)\tau$$

where e is the charge on an electron and m is its mass. The average time between the collisions of an electron with the atoms in the metal is τ.

What are the SI base units of μ?

   A $A\,kg^{-1}$ **B** $A\,s^2\,kg^{-1}$ **C** $A\,s\,kg^{-1}$ **D** $A\,s^{-2}\,kg^{-1}$

3   An aircraft heads in a direction at an angle θ east of north with a horizontal velocity relative to the air of $800\,km\,h^{-1}$. The wind blows with a horizontal velocity of $200\,km\,h^{-1}$ from east to west, as shown.
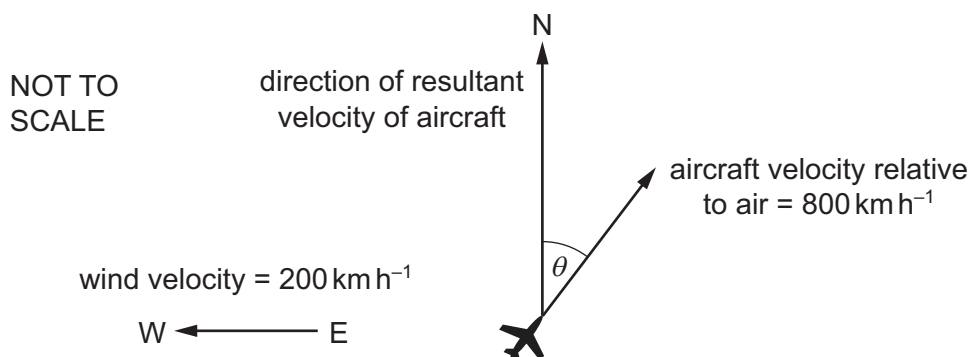
The resultant velocity of the aircraft is in a direction due north.

What is angle θ and what is the magnitude of the resultant velocity?

	$\theta\,/\,^\circ$	resultant velocity$\,/\,km\,h^{-1}$
A	14	770
B	14	820
C	76	770
D	76	820