30 An electron is in an electric field of strength $5 \times 10^4 \, \text{V m}^{-1}$. The field is the only influence on the electron.

The mass and charge of an electron are known.

Which quantity can be calculated without any more information?

A the force on the electron

B the momentum of the electron

C the kinetic energy of the electron

D the speed of the electron

31 In an electrolyte, the electric current is carried by charged particles (ions) in solution.

What is **not** a possible value for the charge on an ion in solution?

A $-4.8 \times 10^{-19} \, \text{C}$

B $+1.6 \times 10^{-19} \, \text{C}$

C $+3.2 \times 10^{-19} \, \text{C}$

D $+4.0 \times 10^{-19} \, \text{C}$

32 The graph shows the variation with length of the resistance of a uniform metal wire.
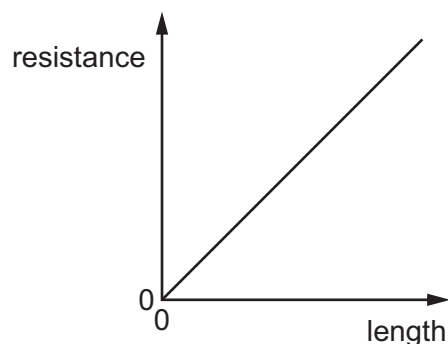
The gradient of the graph is G.
The wire has cross-sectional area A.

Which expression could be used to calculate the resistivity of the metal of the wire?

A $G \times A$ **B** $\dfrac{G}{A}$ **C** $\dfrac{A}{G}$ **D** $G \times A^2$