



- 5 A metal wire has length 75 cm and area of cross-section  $2.0 \times 10^{-7} \text{ m}^2$ . The force constant of the wire is  $1.8 \times 10^4 \text{ N m}^{-1}$ .

When a tensile force of 27 N is applied to the wire, its area of cross-section does not change. Hooke's law is obeyed.

- (a) Calculate the extension of the wire produced by the 27 N force.

$$\text{extension} = \dots \text{m} [2]$$

- (b) The resistivity of the metal of the wire is  $3.2 \times 10^{-8} \Omega \text{ m}$ .

Determine the change of resistance of the wire caused by the extension calculated in (a).

$$\text{change of resistance} = \dots \Omega [2]$$

- (c) A student has available some resistors, a cell and a voltmeter.

Draw a circuit that the student could use to show an increase in resistance of the wire as an increase in voltmeter reading.

[2]

[Total: 6]

