

1 In this experiment, you will investigate a light-dependent resistor (LDR).

- (a) • Connect the circuit shown in Fig. 1.1.

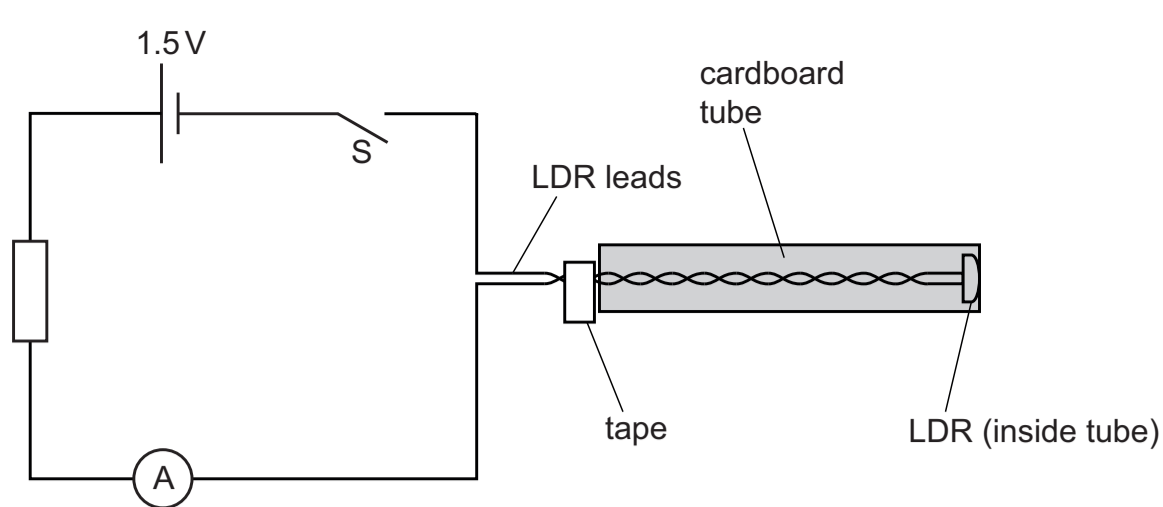


Fig. 1.1

- Ensure that the switch S is open.
- Slide the LDR leads into the tube until the front of the LDR is just level with the open end of the tube, as shown in Fig. 1.1.
- With the LDR in this position, attach a piece of adhesive tape to the leads as a marker at the other end of the tube, as shown in Fig. 1.1.
- Slide the tube until the LDR is approximately half-way along it, as shown in Fig. 1.2.

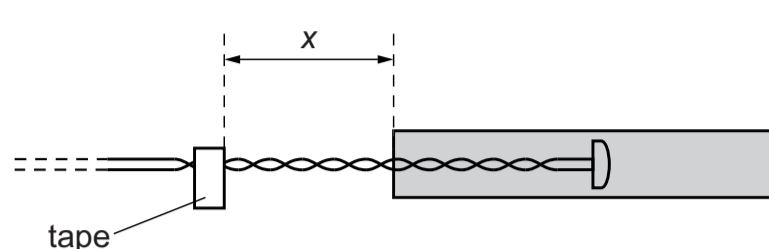


Fig. 1.2

- The distance between the tape and the tube is x .

Measure and record x .

$x = \dots\dots\dots$

- Close S and record the ammeter reading I .

$I = \dots\dots\dots$

- Open S.

[2]

- (b) Change x by moving the LDR to a new position inside the tube, with x in the range 4 cm to 18 cm. Record x and I .

Repeat until you have six sets of values of x and I .

Record your results in a table. Include values of \sqrt{I} in your table.

[10]

- (c) (i) Plot a graph of \sqrt{I} on the y -axis against x on the x -axis.

[3]

- (ii) Draw the straight line of best fit.

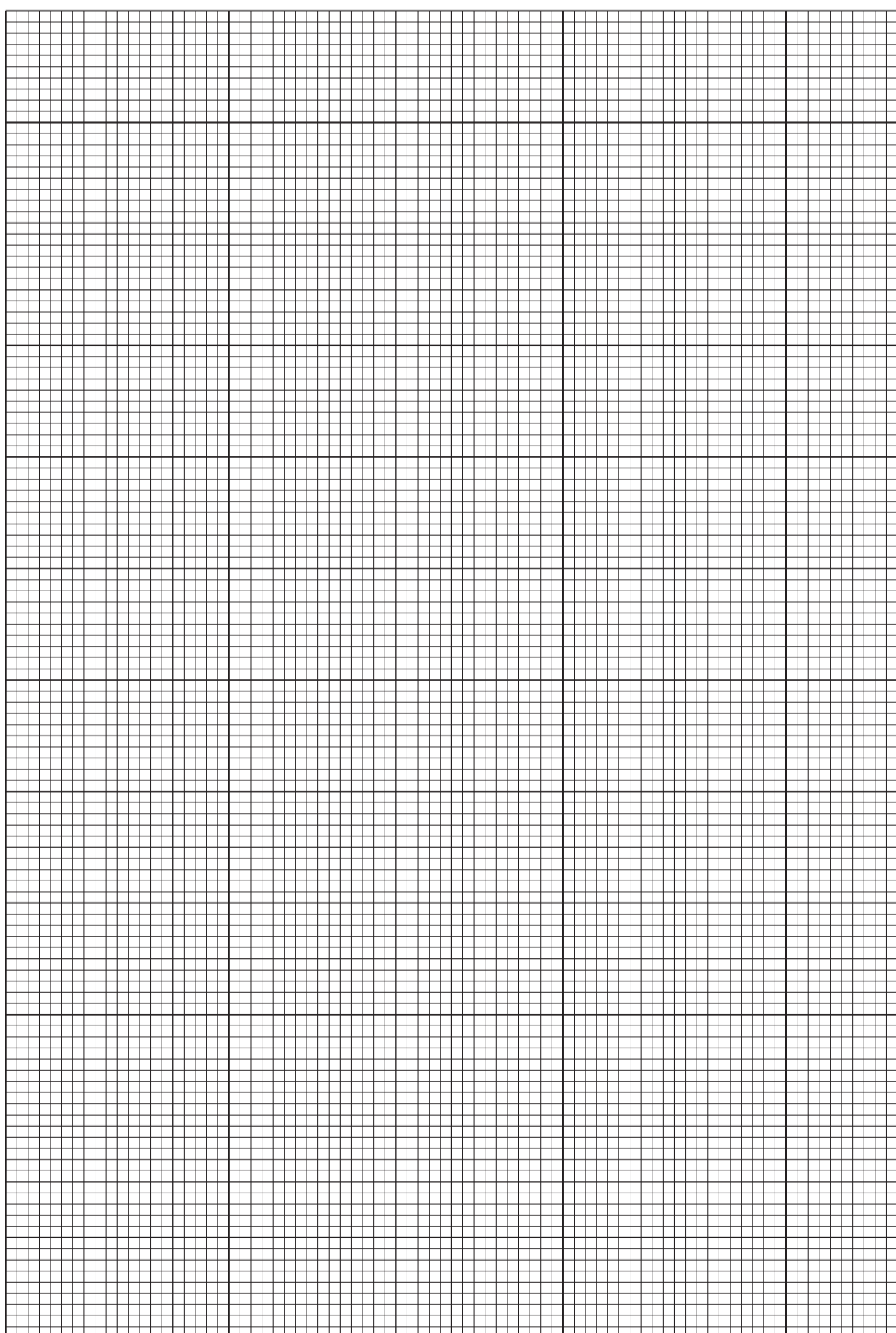
[1]

- (iii) Determine the gradient and y -intercept of this line.

gradient = $\dots\dots\dots$

y -intercept = $\dots\dots\dots$

[2]



- (d) It is suggested that the quantities I and x are related by the equation

$$\sqrt{I} = ax + b$$

where a and b are constants.

Using your answers in (c)(iii), determine the values of a and b .
Give appropriate units.

$a = \dots\dots\dots$

$b = \dots\dots\dots$

[2]

[Total: 20]

You may not need to use all of the materials provided.