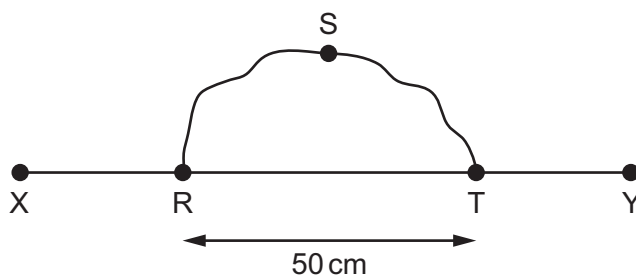


38 A wire RST is connected to another wire XY as shown.



Each wire is 100 cm long with a resistance per unit length of $10\ \Omega\ \text{m}^{-1}$.

What is the total resistance between X and Y?

- A** $3.3\ \Omega$ **B** $5.0\ \Omega$ **C** $8.3\ \Omega$ **D** $13.3\ \Omega$

39 When α -particles are directed at gold leaf

- 1 almost all α -particles pass through without deflection,
- 2 a few α -particles are deviated through large angles.

What are the reasons for these effects?

	1	2
A	most α -particles have enough energy to pass right through the gold leaf	gold is very dense so a few low energy α -particles bounce back from the gold surface
B	most α -particles miss all gold atoms	a few α -particles bounce off gold atoms
C	the gold nucleus is very small so most α -particles miss all nuclei	occasionally the path of an α -particle is close to a nucleus
D	the positive charge in an atom is not concentrated enough to deflect an α -particle	occasionally an α -particle experiences many small deflections in the same direction

40 The nuclide $^{222}_{86}\text{Rn}$ decays in a sequence of stages to form the nuclide $^{206}_{82}\text{Pb}$.

Four of the nuclides formed in the sequence are α -particle emitters. The others are β -particle emitters.

How many nuclides formed in the decay sequence are β -particle emitters?

- A** 2 **B** 4 **C** 8 **D** 12