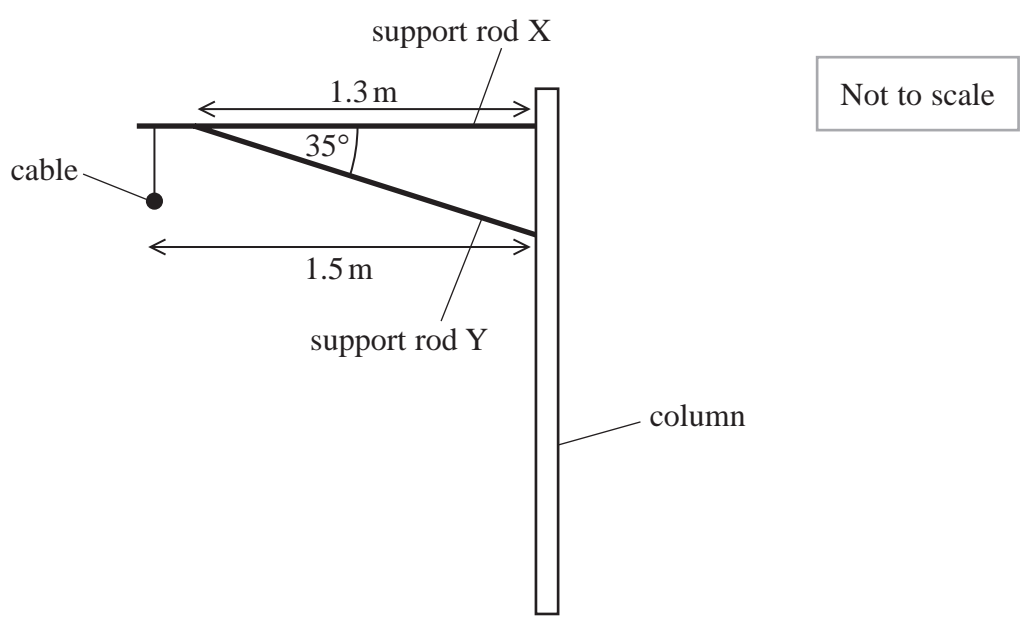


14 Overhead electricity cables for railway lines are supported by structures like the one shown.

An electric cable of mass 45 kg is suspended from a support rod X. A second support rod Y is attached to X. X and Y are attached at one end to a column.

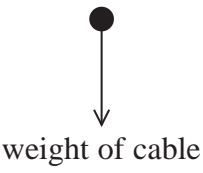


The masses of support rods X and Y are negligible.

- (a) (i) Determine, by taking moments, the force exerted on rod X by rod Y. (4)

Force =

- (ii) Complete the free-body force diagram for support rod X. (2)



- (b) A website gives a value of the electric field strength E , at two distances from the electric cable.

Distance / m	$E / \text{N C}^{-1}$
3	1200
25	100

- Deduce whether these data are consistent with an inverse square law. (3)