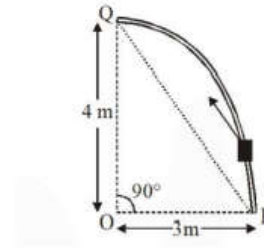


2. Consider an elliptically shaped rail PQ in the vertical plane with $OP = 3\text{ m}$ and $OQ = 4\text{ m}$. A block of mass 1 kg is pulled along the rail from P to Q with a force of 18 N , which is always parallel to line PQ (see the figure given). Assuming no frictional losses, the kinetic energy of the block when it reaches Q is $(n \times 10)$ Joules. The

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value of n is (take acceleration due to gravity = 10 ms^{-2})



Solution :

Using work energy principle,

$$\sum WD = \sum KE$$

$$\therefore -mgh + F \cdot x = KE$$

$$\therefore -(1)(10)(4) + 18 \times \sqrt{4^2 + 3^2} = KE$$

$$\therefore KE = 50$$

$$\therefore n = 5$$