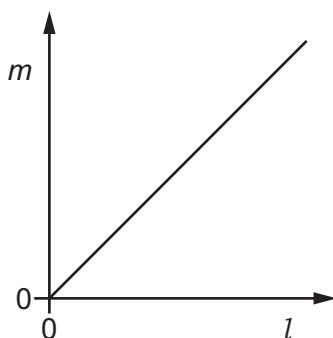


- 14 A balance is used to measure the mass  $m$  of a number of cylindrical metal rods of length  $l$ . All the metal rods have the same radius  $r$ .

The graph shows the variation with  $l$  of  $m$ .

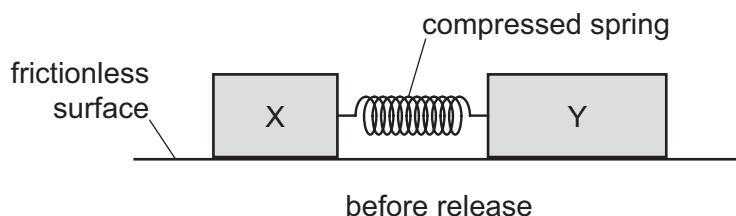


The gradient of the graph is  $G$ .

Which expression gives the density of the metal?

- A**  $\frac{G}{2\pi r}$       **B**  $G2\pi r$       **C**  $\frac{G}{\pi r^2}$       **D**  $G\pi r^2$
- 15 Two blocks, X and Y, are on a horizontal frictionless surface. The mass of block Y is greater than that of block X. Block Y has a spring attached to its end.

The blocks are pushed together so that the spring is compressed between them and the blocks are held stationary as shown.



When released, the blocks move in opposite directions.

Which statement is correct?

- A** After release, the kinetic energy of block X must equal the kinetic energy of block Y.  
**B** After release, the sum of the kinetic energies of the blocks is equal to zero.  
**C** The total energy of the spring and blocks immediately before release is zero.  
**D** The total energy of the spring and blocks is equal to the energy needed to bring the blocks together.