

3

A spring is supported so that it hangs vertically, as shown in Fig. 3.1.

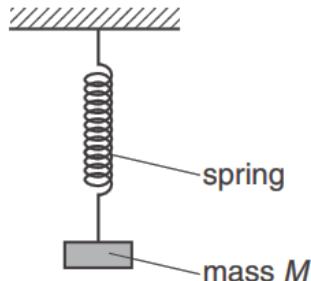


Fig. 3.1

Different masses are attached to the lower end of the spring. The extension x of the spring is measured for each mass M . The variation of M with x is shown in Fig. 3.2.

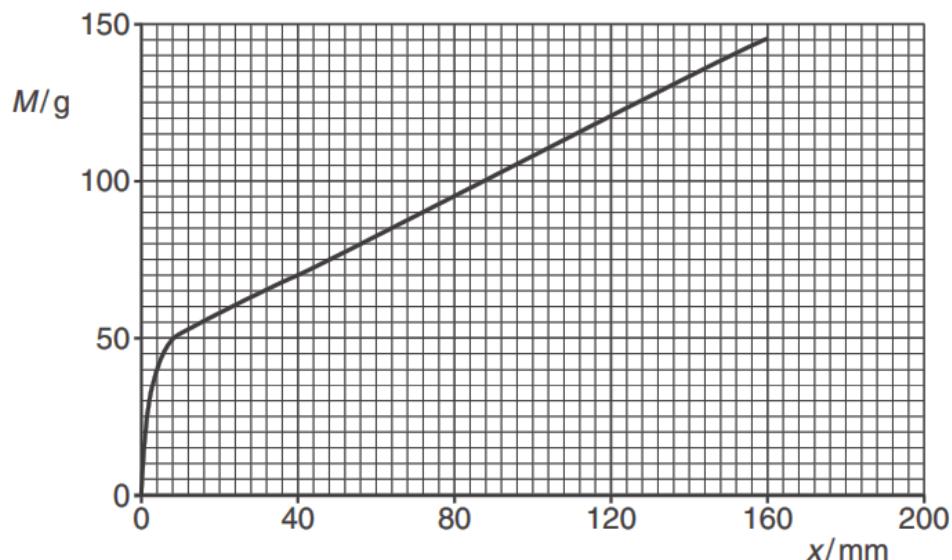


Fig. 3.2

(a)

With reference to Fig. 3.2, state and explain whether the spring obeys Hooke's Law.

[2]

(b)

Describe how to determine whether the spring is permanently deformed after the graph in Fig. 3.2 is obtained.

[1]

(c)

Calculate the work done on the spring as it is extended from $x = 40.0$ mm to 160.0 mm.

$x =$

Explain your working.

work done = J

[3]

[Total: 6]

