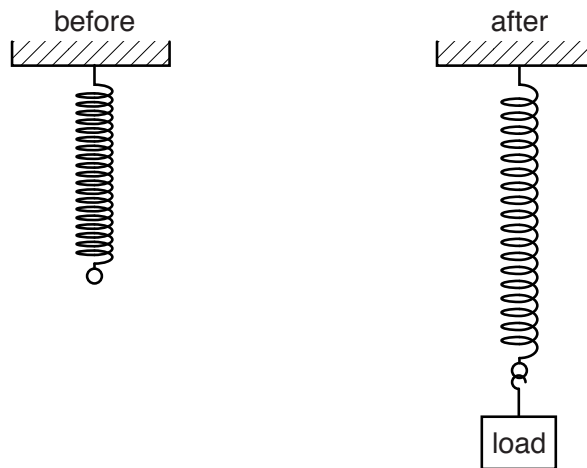


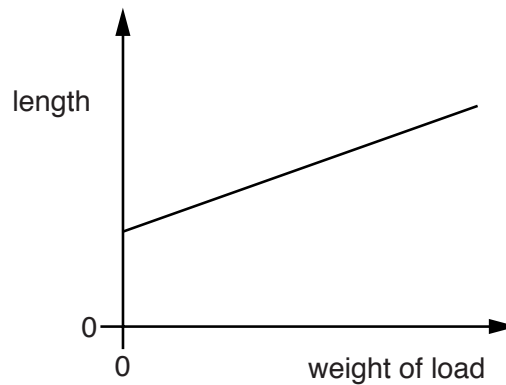
## Hooks law

- 1) Fig. 2.1 shows a spring before and after it is stretched by a small load.



**Fig. 2.1**

- (a) On Fig. 2.1,
- (i) mark the extension caused by the load,
  - (ii) draw the apparatus needed to determine the extension.
- [2]
- (b) Fig. 2.2 shows a sketch graph of the length of the spring, plotted against the weight of the load.



**Fig. 2.2**

- On Fig. 2.2, mark clearly the unstretched length of the spring. [1]
- (c) State the unit in which the weight of the load is measured.

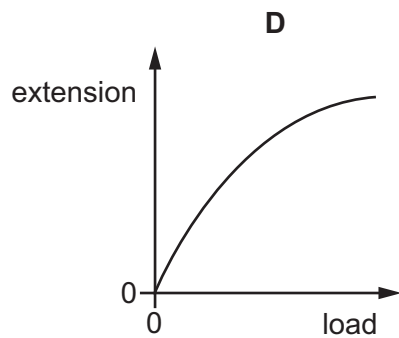
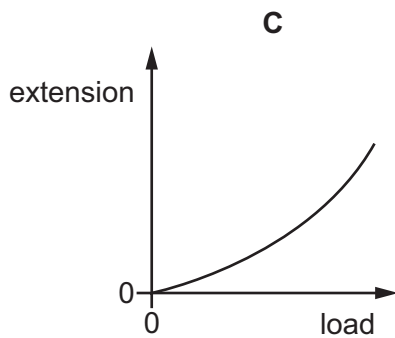
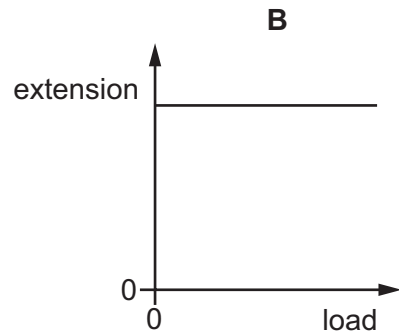
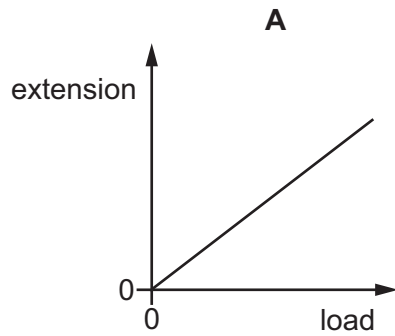
.....[1]

[Total: 4]

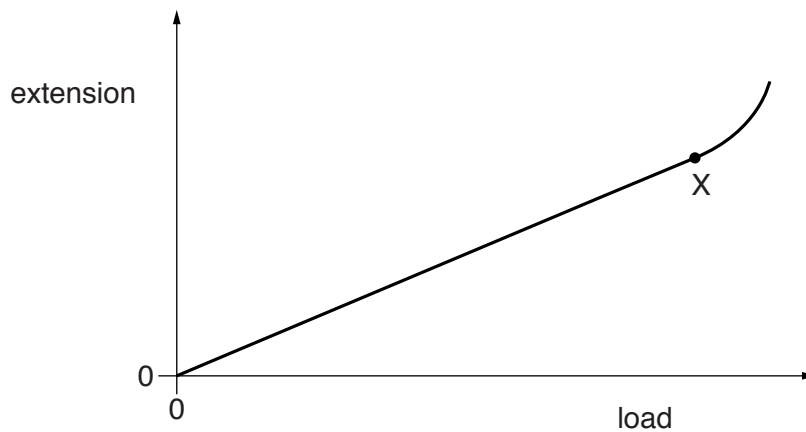
## Hooks law

2) A spring obeys Hooke's law.

Which graph is obtained by plotting the extension of the spring against the load applied?



3) The trampoline springs are tested. An extension-load graph is plotted for one spring. Fig. 3.2 is the graph.



**Fig. 3.2**

(i) State the name of the point X.

.....[1]

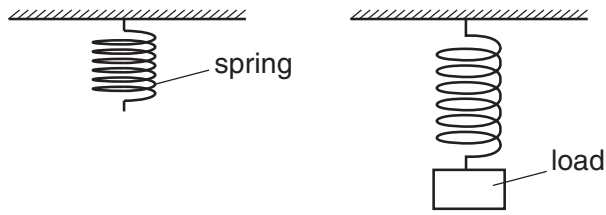
(ii) State the name of the law that the spring obeys between the origin of the graph and point X.

.....[1]

## Hooks law

4)

Fig. 2.1 shows a spring before and after a load is added.

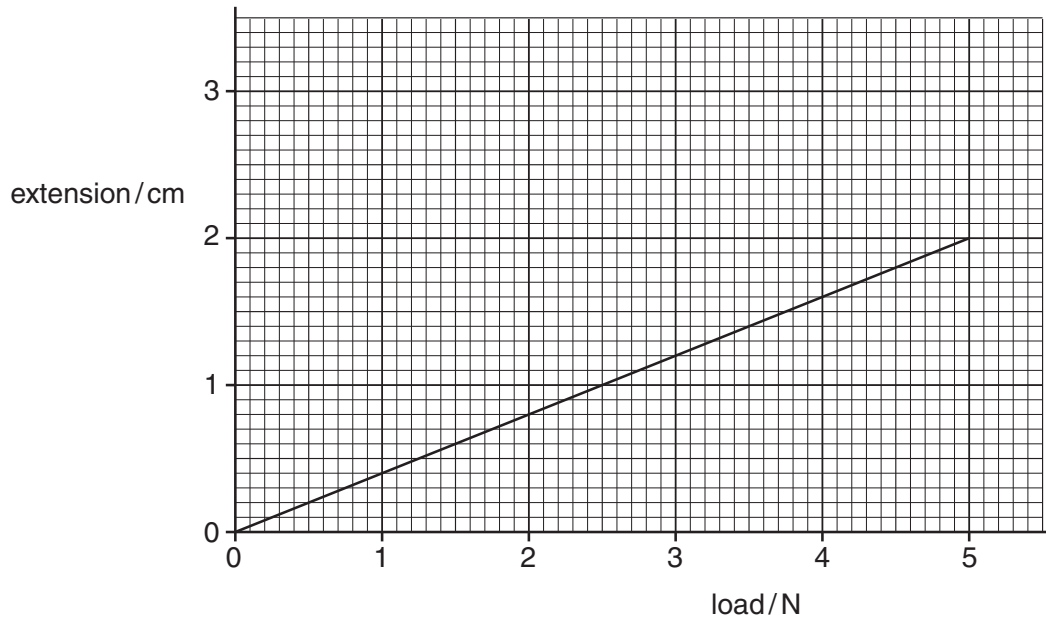


**Fig. 2.1**

(a) What is meant by the *extension* of the spring?

.....  
.....[1]

(b) When the graph of extension against load is drawn for the spring, the result is the line shown in Fig. 2.2.



## Hooks law

(i) The unstretched length of the spring is 9.0 cm.

1. Calculate the total length of the spring when a 5.0 N load is hanging from the spring.

length = ..... cm [2]

2. Find the extension that will be caused by a load of 2.0 N.

extension = ..... cm [1]

(ii) Calculate the mass of a load of weight 2.0 N.

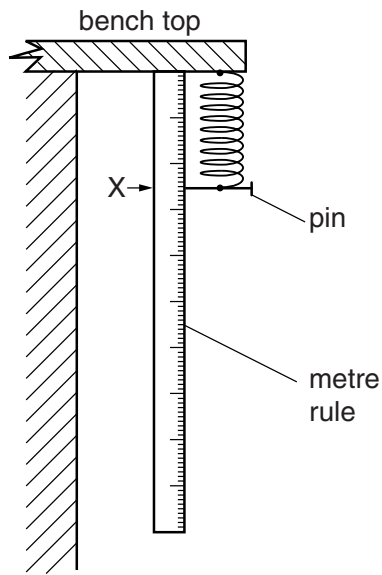
mass = ..... [2]

[Total: 6]

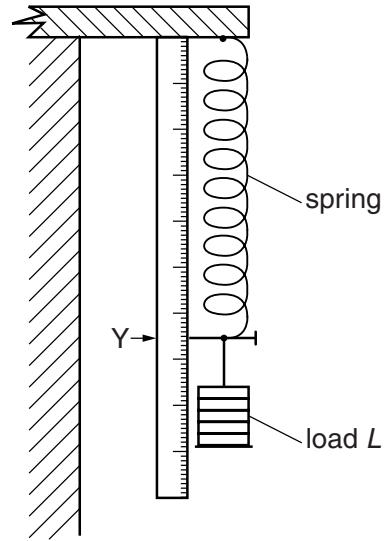
## Hooks law

5)

A spring is attached to the underside of the edge of a bench. A metre rule is fixed next to it, as shown in Fig. 2.1.



**Fig. 2.1**



**Fig. 2.2**

When there is no load on the spring, the marker pin is at X.

When a load of weight  $L$  is hanging on the spring, the marker pin is at Y, as shown in Fig. 2.2.

(a) Describe how you would determine the value of the extension of the spring caused by the load.

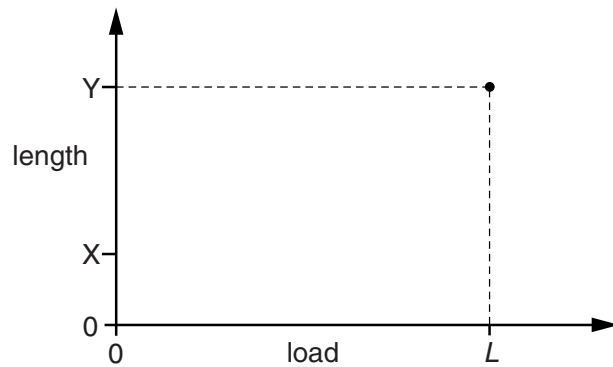
.....

.....

.....

.....[3]

(b) On Fig. 2.3, sketch the graph you would expect to be able to obtain as the spring is gradually stretched from X to Y.



**Fig. 2.3**

[1]

[Total: 4]