

Questions

- 25 The table shows the total length of a spring when different loads are applied.

Load in N	Total length in cm
2	12
3	15

- a) What extension is produced in the spring by a load of 1 N?
 b) Calculate the original length of the spring.
- 26 The spring in a chest expander has a natural length of 24 cm. A force of 1 N stretches the spring 0.4 cm. Calculate the force needed to stretch the spring to a total length of 60 cm.
- 27 The following results were obtained from a stretching experiment.

Force on the spring in N	0	1	2	3	4	5	6
Extension in cm	0	1.5	3.0	4.5	6.0	7.5	9.0

Force on the spring in N	0	1	2	3	4	5	6
Extension in cm	0	3.5	7.5	11.5	15.5	18.5	20

Plot graphs of force against extension and mark any regions that follow Hooke's law.

- 28 Hannah is investigating Hooke's Law. She applied different loads to the same helical spring. She obtained the following incomplete set of results.

Load in N	0	3	6	9	12
Length of spring in cm	6	8	10	12	14
Extension in cm					

- a) Complete the last row of Hannah's table of results.
 b) Explain whether or not Hooke's Law was obeyed in Hannah's experiment.

Moments and levers

Moment of a force

Door handles are usually placed as far from the hinges as possible so that the door opens and closes easily. A much larger force would be needed if the handle were near the hinges. Similarly, it is easier to tighten or loosen a nut with a long spanner than with a short one.

The **turning effect** or **moment** of a force depends on two factors:

- 1 the size of the force
- 2 the distance the force is from the turning point or **pivot**.

(Occasionally you may see the word fulcrum which is the old English word for pivot.)