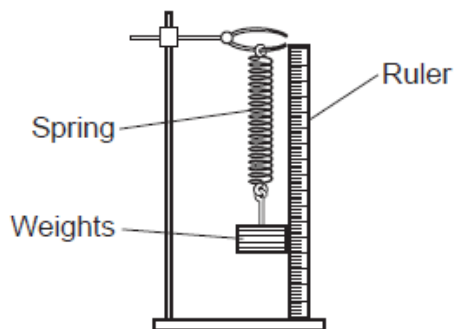


**GCSE Physics B (Twenty First Century Science)**  
**J259/02** Depth in physics (Foundation Tier)

**Question Set 23**

1

Li does an experiment to find the spring constant of a spring.



Li measures the extension of the spring when different weights are added, and records the results in the table.

Weight (N)	Extension (cm)
0	0
1.0	1.5
2.0	3.0
3.0	4.5
4.0	6.0
5.0	7.5

(a) (i) Plot the remaining **two** points on **Fig. 1.1** and draw a line of best fit.

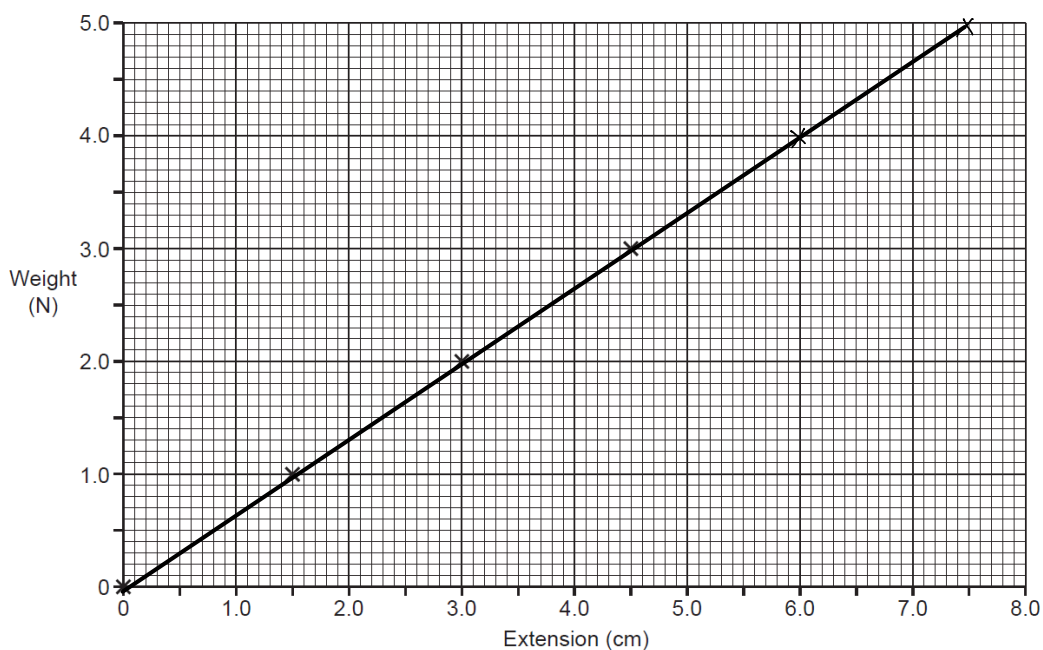


Fig. 1.1

[2]

- (ii) Describe the relationship between weight and the extension of the spring. [1]

They are directly proportional.

- (iii) Calculate the spring constant of the spring.  
Show your working on Fig. 1.1.

Use the equation: spring constant = force  $\div$  extension

Give your answer to 2 significant figures.

$$k = \frac{F}{\Delta L} = \frac{5}{7.5} = 0.67 \text{ N/cm} \quad (2\text{sf})$$

Spring constant = ..... 0.67 ..... N/cm [3]

- (b) Fig. 1.2 shows Li's results for another elastic material.

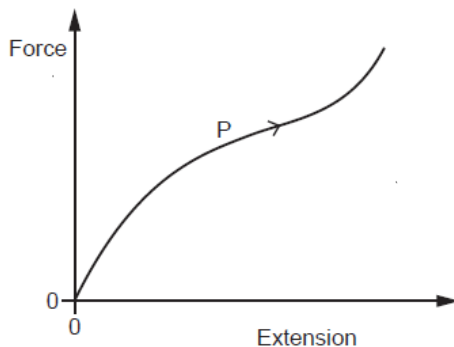


Fig. 1.2

Complete the following statements about Fig. 1.2.

Put a ring around the correct choices.

The relationship for the elastic material is linear / non-linear.

The elastic material could be a rubber band / metal wire.

[2]

## Total Marks for Question Set 23: 8

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