

Hooke's Law

Question Paper

Level	A Level
Subject	Physics
Exam Board	Edexcel
Topic	Mechanics
Sub Topic	Hooke's Law
Booklet	Question Paper
Paper Type	Multiple Choice

Time Allowed: **10 minutes**

Score: **/8**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

Use the following information to answer questions 1 and 2.

A spring obeys Hooke's law. A force of 2.0 N extends the spring by 0.30 m.

1 A 6.0 N force will extend the spring by

- A 0.10 m
- B 0.30 m
- C 0.60 m
- D 0.90 m

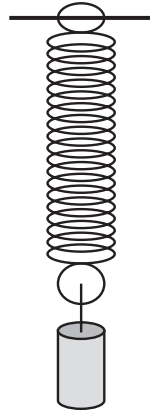
(Total for Question = 1 mark)

2 The energy stored in the spring when a force of 2.0 N is applied is

- A 0.09 J
- B 0.30 J
- C 0.60 J
- D 0.90 J

(Total for Question = 1 mark)

- 3 A spring is suspended from a bar. When a load of 6.0 N is added to the bottom of the spring, its length changes from 0.040 m to 0.13 m.



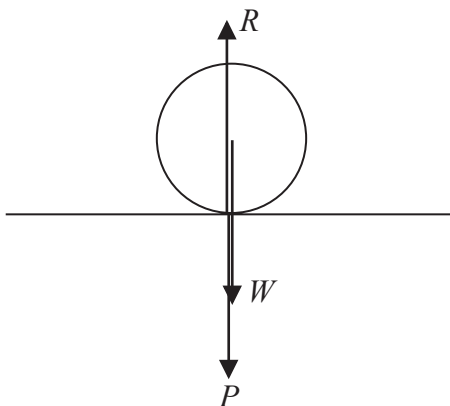
To find the spring constant of the spring you would use

- A $\frac{0.13 \text{ m}}{6.0 \text{ N}}$
- B $\frac{6.0 \text{ N}}{0.13 \text{ m}}$
- C $\frac{6.0 \text{ N}}{0.090 \text{ m}}$
- D $\frac{0.090 \text{ m}}{6.0 \text{ N}}$

(Total for Question = 1 mark)

4 An apple is at rest on the ground.

The diagram shows three forces of equal magnitude.



W = weight of apple

P = push of apple on ground

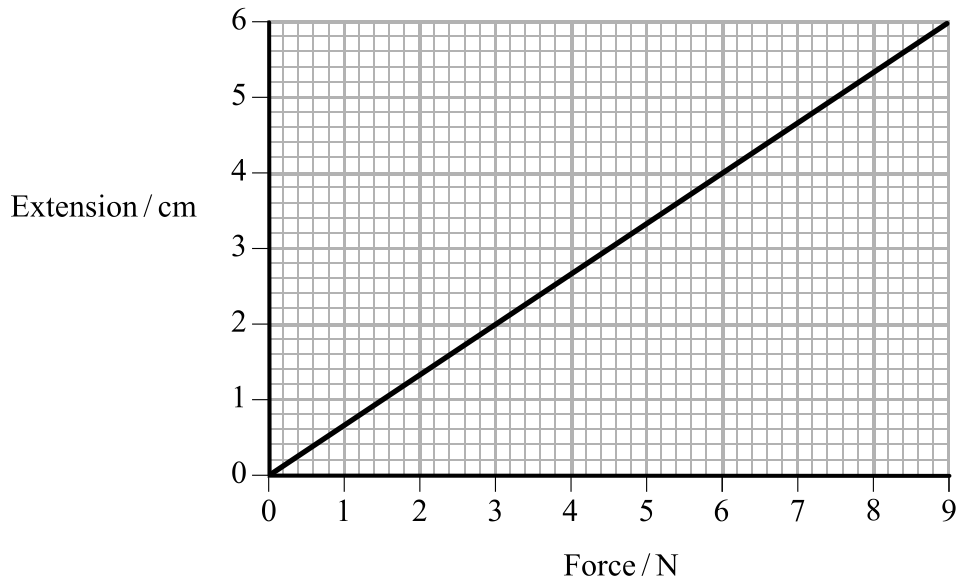
R = normal contact force of ground on apple

Which row in the table shows Newton's first and third laws being applied correctly.

	Newton's first law	Newton's third law
<input type="checkbox"/> A	$P = W$	$R = P$
<input type="checkbox"/> B	$R = P$	$W = R$
<input type="checkbox"/> C	$W = R$	$P = W$
<input type="checkbox"/> D	$W = R$	$R = P$

(Total for Question = 1 mark)

5. The graph shows how extension varies with applied force for a spring.



5 The stiffness of the spring in Nm^{-1} is

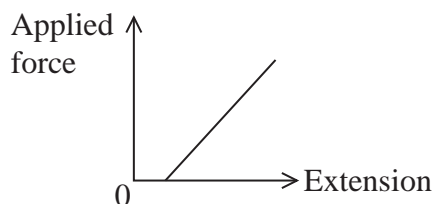
- A 1.5
- B 54
- C 67
- D 150

(Total for Question = 1 mark)

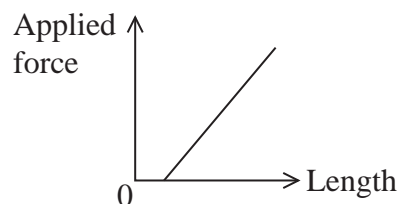
Questions 6 and 7 refer to the graphs and information below.

A force is applied to a spring and the spring extends. The new length of the spring is recorded.

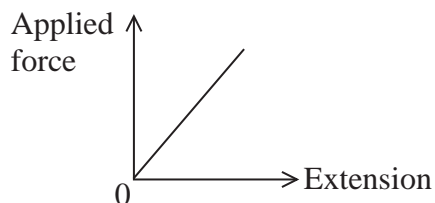
This procedure is repeated for different applied forces.



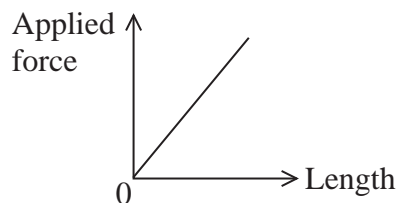
P



Q



R



S

6 Which of the above graphs could be obtained from this experiment?

- A P and Q
- B P and S
- C R and Q
- D R and S

(Total for Question = 1 mark)

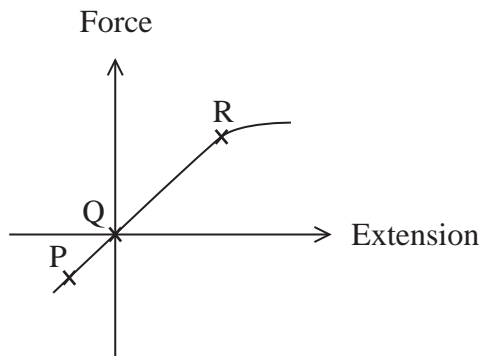
7 The graphs could show that the spring is


- A obeying Hooke's law.
- B extending plastically.
- C extended beyond the limit of proportionality.
- D being compressed as well as extended.

(Total for Question = 1 mark)













8 A force is applied across the ends of a spring and the following force-extension graph is drawn.

Three points, P, Q and R, are marked on the graph. At point Q the applied force is zero.



In the table below, the spring is represented using diagrams drawn to scale. The spring at Q is represented by .

Select the row from the table that correctly represents the length of the spring at positions P, Q and R.

	P	Q (no applied force)	R
<input type="checkbox"/> A			
<input type="checkbox"/> B			
<input type="checkbox"/> C			
<input type="checkbox"/> D			

(Total for Question = 1 mark)