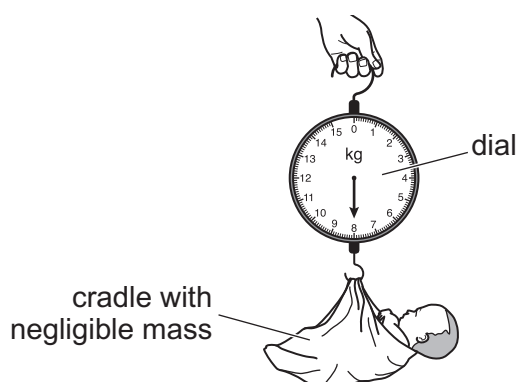


**SMART EXAM RESOURCES**  
**SUBJECT: PHYSICS**  
**TOPIC: HOOKE'S LAW**  
**SET-1-QP-MS**

- 1 Fig. 2.1 shows a spring balance used to measure the weight of a baby. The spring inside the balance extends when a mass is suspended from it. The dial shows the extension of spring as a value of mass in kg.



**Fig. 2.1**

The spring obeys Hooke's law up to a weight of 175 N.

- (a) (i) State Hooke's law.

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

- (ii) State the relationship between the mass of the baby and the force exerted on the spring due to the baby.

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

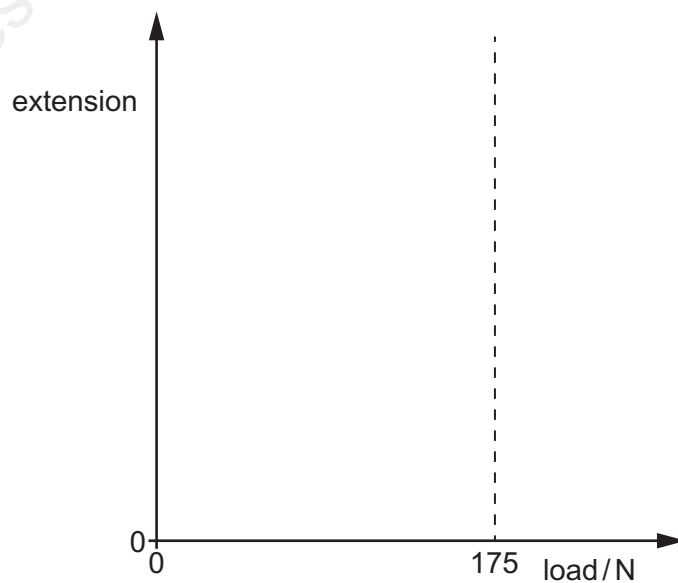
- (iii) The reading on the spring balance is 8.0 kg.

Determine the force exerted on the spring due to the baby.

force = ..... [1]

- (b) The limit of proportionality for the spring is at a force of 175 N.

Sketch the extension–load graph for the spring. The sketch must continue beyond a force of 175 N.

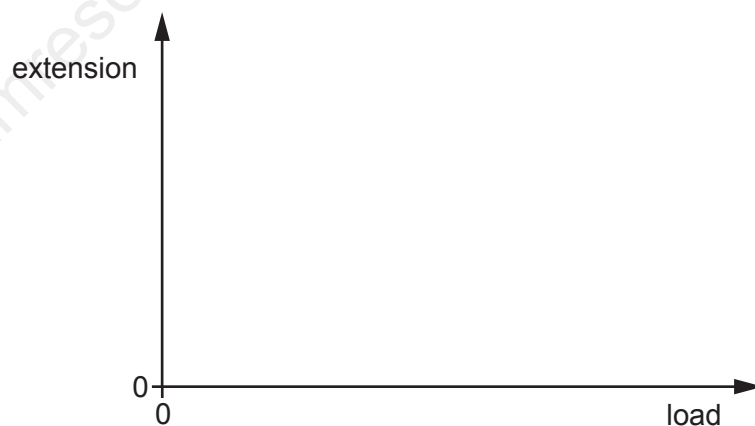


[2]

## MARK SCHEME:

Question	Answer	Marks
(a)(i)	extension (of the spring) is (directly) proportional to the force / load (applied to the spring, up to the limit of proportionality)	B1
(a)(ii)	$W=mg$ in any form OR force is (directly) proportional to mass	B1
(a)(iii)	80 N	B1
(b)	straight line through / from origin with positive gradient up to 175 N	B1
	smooth curve after 175 N with increasing positive gradient	B1
(c)	$(80\text{ N} \times 3.5\text{ m}) = 280\text{ J}$	A2
	$\Delta E = Fxd$ in any form OR $GPE = mgh$ in any form	(C1)

- 2 On Fig. 1.2, sketch an extension–load graph for a spring. Label the limit of proportionality with the letter L on your graph.



**Fig. 1.2**

[2]

## MARK SCHEME:

graph initially straight line with positive gradient that passes through the origin	<b>B1</b>
point labelled, <u>increasing</u> gradient to the right	<b>B1</b>