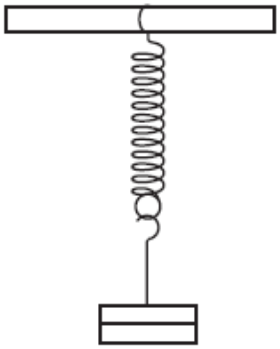
Oxford Cambridge and RSA

GCSE Physics B (Twenty First Century Science)

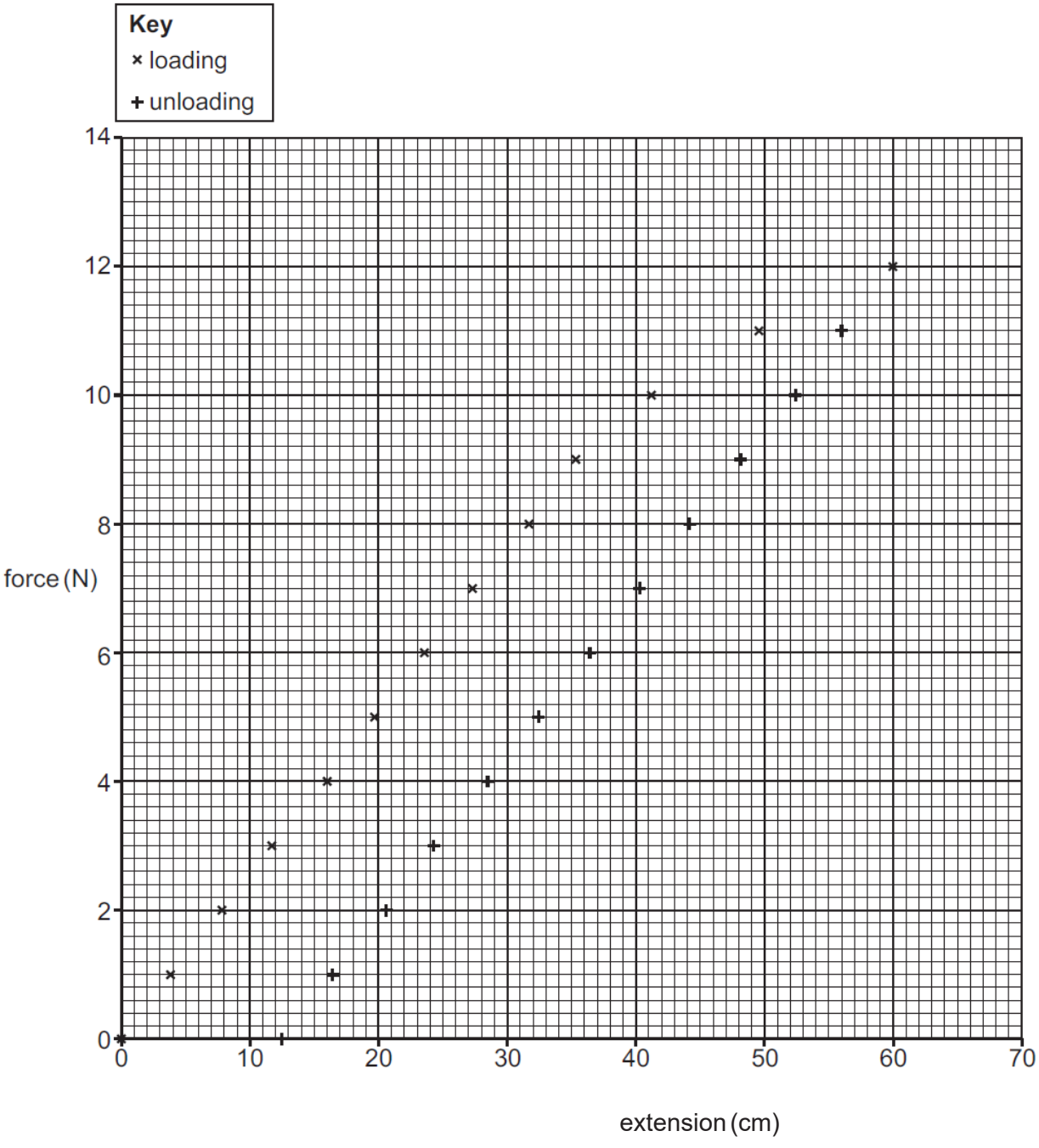
J259/03 Depth in physics (Higher Tier)

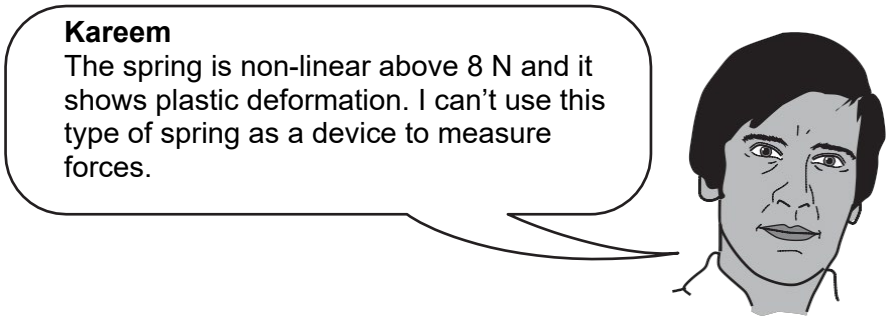
Question Set 17

1 Kareem investigates the behaviour of a spring when it is loaded with masses and then unloaded.



He measures the extension of the spring each time he changes the load and plots his data onto the graph shown below.





(a) **(i)** Explain how the data from the graph shows that the spring is non-linear.

[2]

(ii) Suggest whether a non-linear spring could be used as a device to measure forces.

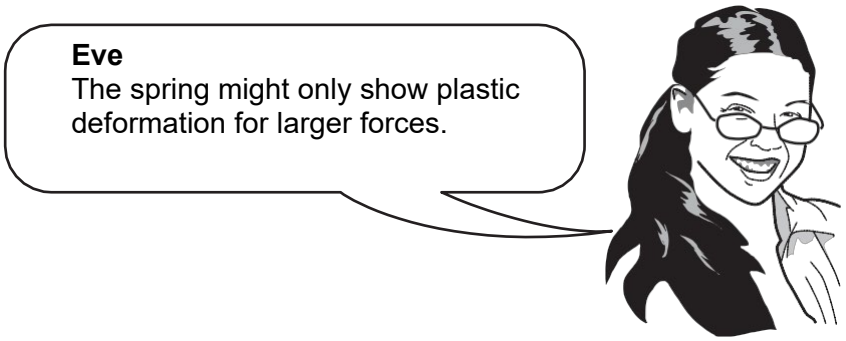
Justify your answer.

[1]

(b) **(i)** Explain how the data on the graph shows plastic deformation.

[1]

(ii) Eve also looks at the data shown on the graph.



Suggest how to find out the force at which plastic deformation begins for this type of spring. **[2]**

(c) Kareem uses his spring to measure the weight of a metal block as 5.1N.

Calculate the mass of the metal block.

Use the equation: weight = mass x gravitational field strength

Gravitational field strength = 10 N / kg

Mass = ...kg **[2]**

Total Marks for Question Set 17: 8