5 (a) A metal spring obeys Hooke's law.

Sketch a graph to show that the spring obeys Hooke's law as it is stretched.

You should label both axes with appropriate physical quantities.

(3)

Turn over ▶

P 7 5 8 2 6 A 0 1 1 3 2

(b) Diagram 1 shows an object suspended from a support using a metal spring.
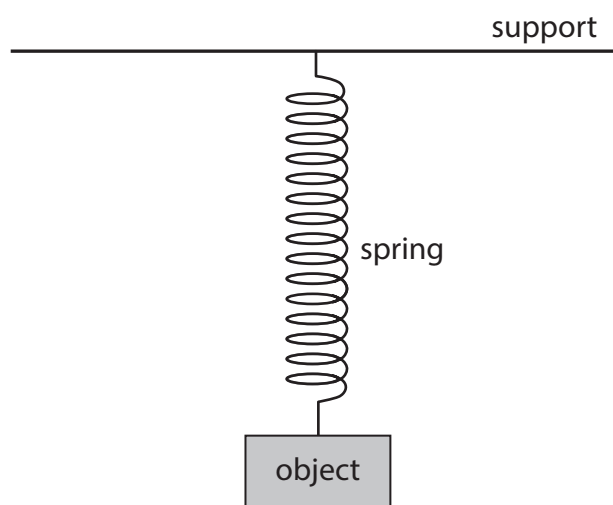
The object is initially at rest.

support

spring

object

Diagram 1

(i) The object is pulled down and then released.

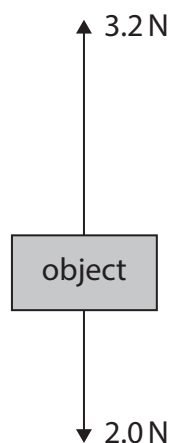Diagram 2 shows the forces acting on the object at the instant it is released.

3.2 N

object

2.0 N

Diagram 2

Determine the magnitude and direction of the resultant force acting on the object.

(2)

magnitude of resultant force = ... N

direction of resultant force = ...

(ii) The object has a mass of 0.20 kg.

Calculate the acceleration of the object at the instant it is released.

(3)

acceleration = ... m/s^2

(iii) Explain how the magnitude of the acceleration of the object changes, from the instant the object is released until the first time the object returns to its initial resting position.

You should refer to the forces acting on the object in your answer.

(3)

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(Total for Question 5 = 11 marks)

P7 5 8 2 6 A 0 1 3 3 2