3 Fig. 3.1 shows a marble falling onto a spring when released from height of 6.0 cm above the top of the spring. The maximum compression of the spring is 5.0 cm. The spring obeys Hooke's law and has a spring constant of 25 N m^{-1}. You may assume that air resistance is negligible.

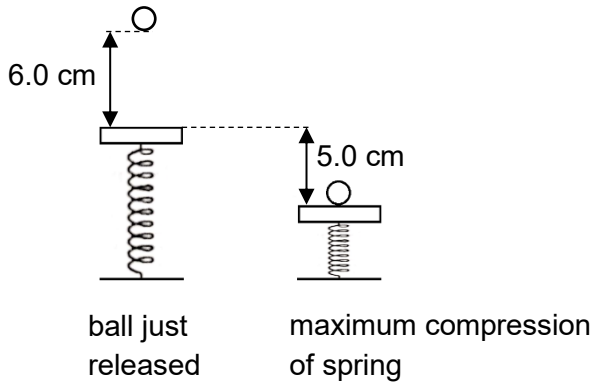

Fig. 3.1

(a) By using the principle of conservation of energy, show that the mass of the ball is 0.029 kg.

[1]

(b) Explain, in terms of forces, why the speed of the marble continues to increase for a period of time after hitting the surface of the spring.

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……..... [2]

(c) Hence, determine the maximum kinetic energy of the marble.

energy = …… J [4]