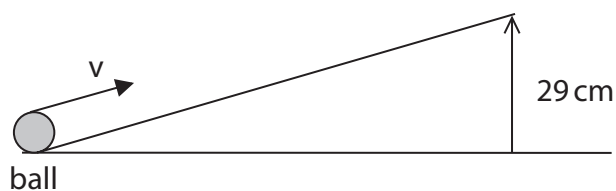


- 5 The diagram shows a ball at the bottom of a ramp. The ball moves up the ramp with an initial speed v .



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- (a) State the formula linking gravitational potential energy (GPE), mass, gravitational field strength (g) and height.

(1)

- (b) The ball has a mass of 14 g.

Show that when the ball reaches a height of 29 cm above the bottom of the ramp, the GPE gained by the ball is about 4×10^{-2} J.

(3)

- (c) At the bottom of the ramp, the 14 g ball has a kinetic energy (KE) of 5.1×10^{-2} J.

Calculate the speed of the ball at the bottom of the ramp.

(3)

speed = m/s



- (d) The ball is stationary when it reaches the top of the ramp. There is a difference between the KE of the ball at the bottom of the ramp and the GPE of the ball at a height of 29 cm above the bottom of the ramp.

Explain why the work done by friction between the ball and the ramp is equal to this difference.

(2)

(Total for Question 5 = 9 marks)

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