OCR
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AS Level Physics A

H156/01 Breadth in Physics

Question Set 11

1 A trolley is placed on a long ramp and is released from rest from the top of the ramp. It travels to the bottom of the ramp with a constant acceleration.

(a) Describe how a metre rule and a stopwatch can be used to determine the **final** velocity *v* of the trolley at the bottom of the ramp.

[2]

(b) A motion sensor is used to determine the velocity of the trolley at points **X** and **Y**, as shown in Fig. 21.

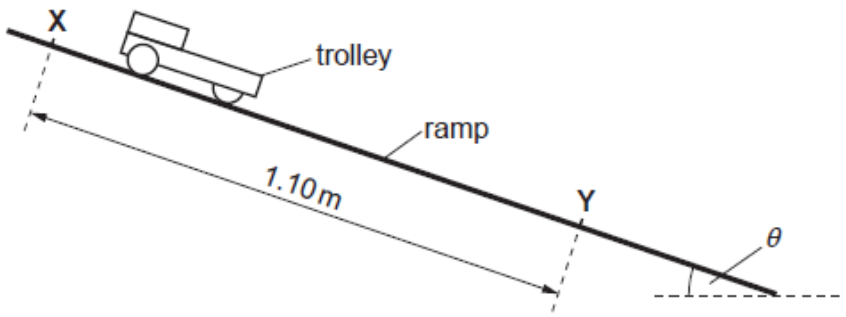

Fig. 21 (not to scale)

The distance between **X** and **Y** is 1.10 m. The trolley has velocity 1.3 m s^{-1} at **X** and velocity 2.5 m s^{-1} at **Y**.

(i) Calculate the acceleration *a* of the trolley.

a = ... m s^{-2} **[2]**

(ii) The frictional forces acting on the trolley are negligible.
The acceleration of the trolley down the ramp is equal to the component of the acceleration of free fall parallel to the ramp.
Use your answer to **(b)(i)** to calculate the angle θ between the ramp and the horizontal.

θ = ... °

[2]

Total Marks for Question Set 11: 6

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