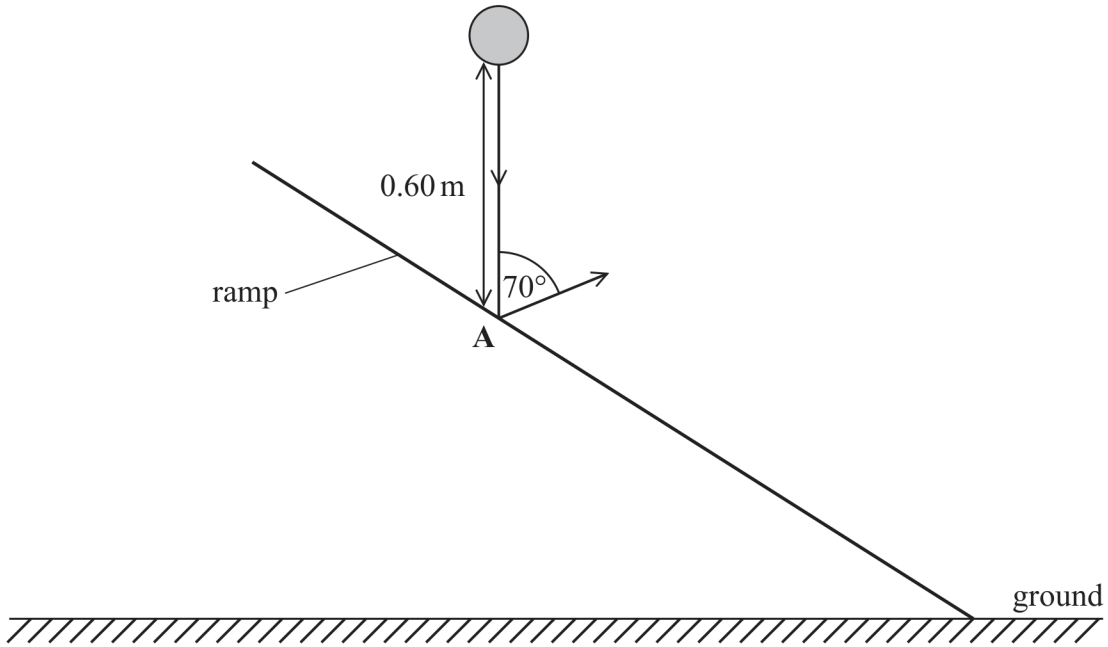
15 A ball falls through a vertical height of 0.60 m before bouncing at point A on a ramp, as shown.



(a) Show that the velocity of the ball immediately before the bounce is about 3 m s^{-1}.

(2)

.....

.....

.....

.....

(b) Kinetic energy is conserved as the ball bounces off the ramp. The ball bounces at an angle of 70° to the vertical.

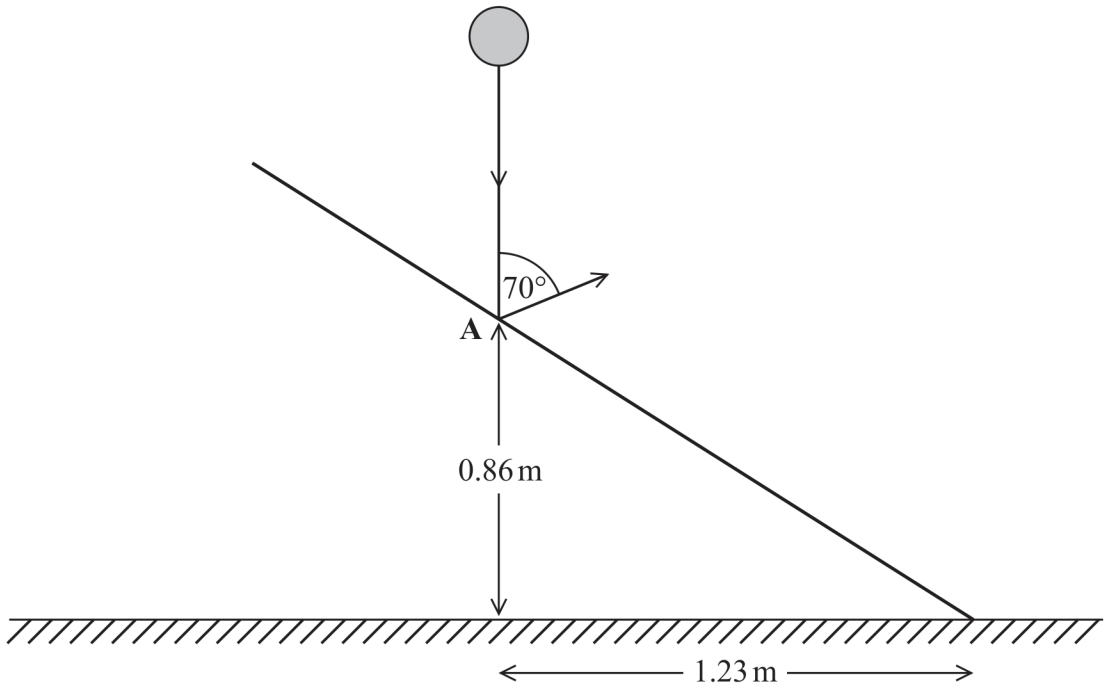
State expressions for the horizontal and vertical components of velocity of the ball immediately after the bounce.

(2)

Horizontal component = ...

Vertical component = ...

(c) Point A is 0.86 m vertically above the ground and 1.23 m horizontally from the end of the ramp as shown.



Deduce whether the ball will bounce a second time on the ramp.

(4)

(Total for Question 15 = 8 marks)