1 A small ball at the bottom of a frictionless slope is projected up the slope with speed u, as shown in Fig. 1.1.

The slope has a height of 4.0 m and makes an angle of 30° to the horizontal ground.

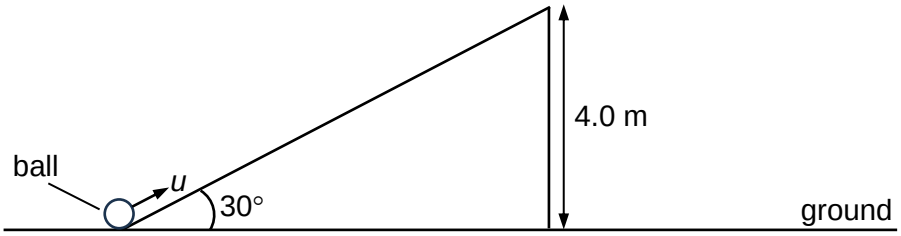

Fig. 1.1

(a) In one instance, $u = 7.0$ m s^{-1}.

(i) Calculate the maximum distance s_0 from the bottom of the slope that the ball reaches.

s_0 = ... m [2]

(ii) As the ball moves up the slope from the bottom, draw on Fig. 1.2 the variation with distance s travelled by the ball from the bottom of the slope of its

1. kinetic energy (label as E_K),

2. potential energy (label as E_P).

Potential energy at the bottom of the slope is zero.

[2]

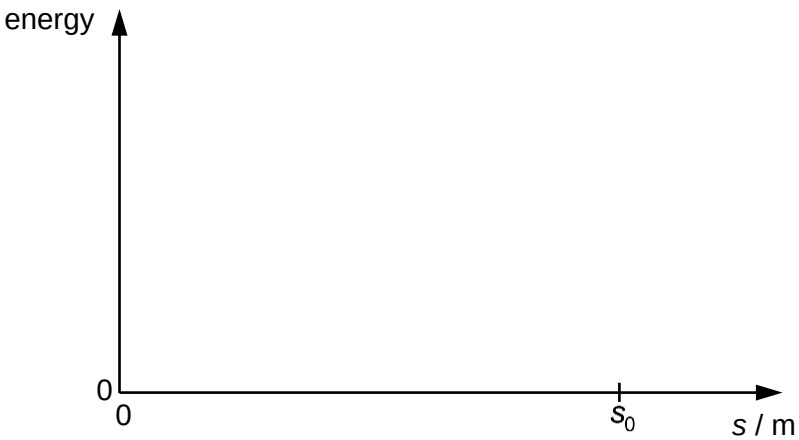

Fig. 1.2

(b) In another instance, $u = 14.0$ m s^{-1}.

The ball travels to the top of the slope, leaves the slope and hits the ground.

(i) Show that the speed of the ball at the top of the slope is 10.8 m s^{-1}.

[1]

(ii) Calculate the horizontal distance travelled by the ball after it leaves the slope.

distance = ... m [3]

[Total: 8]