1 A ball is thrown from the ground and follows the path shown in Fig. 1.1. The ground is horizontal. The effect of air resistance is negligible.
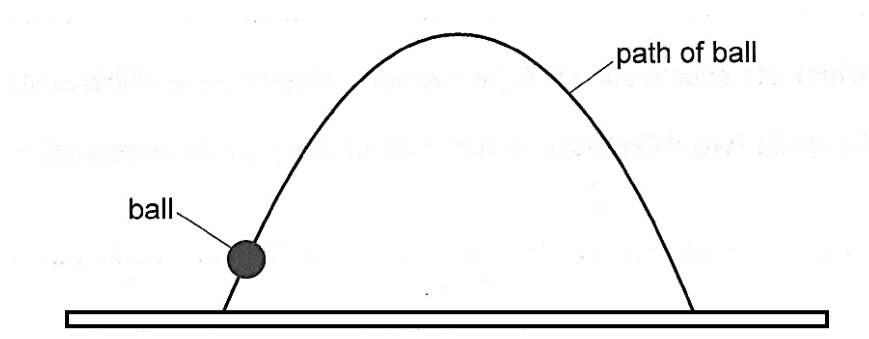

Fig. 1.1 (not to scale)

(a) (i) Describe the variation in the vertical velocity and the vertical acceleration of the ball throughout the path.

....

....

....

....

....

....

....[3]

(ii) Describe the variation in the horizontal velocity and the horizontal acceleration of the ball throughout the path.

....

....

....

....[2]

(b) **(i)** The initial velocity of the ball is 15 m s⁻¹ at an angle of 20° to the horizontal.

Calculate the horizontal distance travelled by the ball before hitting the ground.

horizontal distance = ... m   [3]

(ii) The ball is now thrown at the same speed and angle from a cliff edge. The cliff height is 70 m.

Calculate the extra horizontal distance travelled by the ball before hitting the ground when thrown from the cliff edge.

extra horizontal distance = ... m   [4]

[Total: 12]