2 A student throws a ball vertically upwards with a speed of $5.0\,m\,s^{-1}$. The ball is released at this speed at a height of 1.5 m above the ground.

Air resistance is negligible.

(a) Calculate:

(i) the speed of the ball as it hits the ground

speed = ... $m\,s^{-1}$ [2]

(ii) the time between the ball being released and the ball hitting the ground.

time = ... s [2]

(b) Using your answers to **(a)(i)** and **(a)(ii)**, draw on Fig. 2.1 the variations with time t of the displacement s, the velocity v and the acceleration a of the ball.

Add a suitable scale to each vertical axis.

Take ground level as the zero of displacement and the upwards direction as positive.

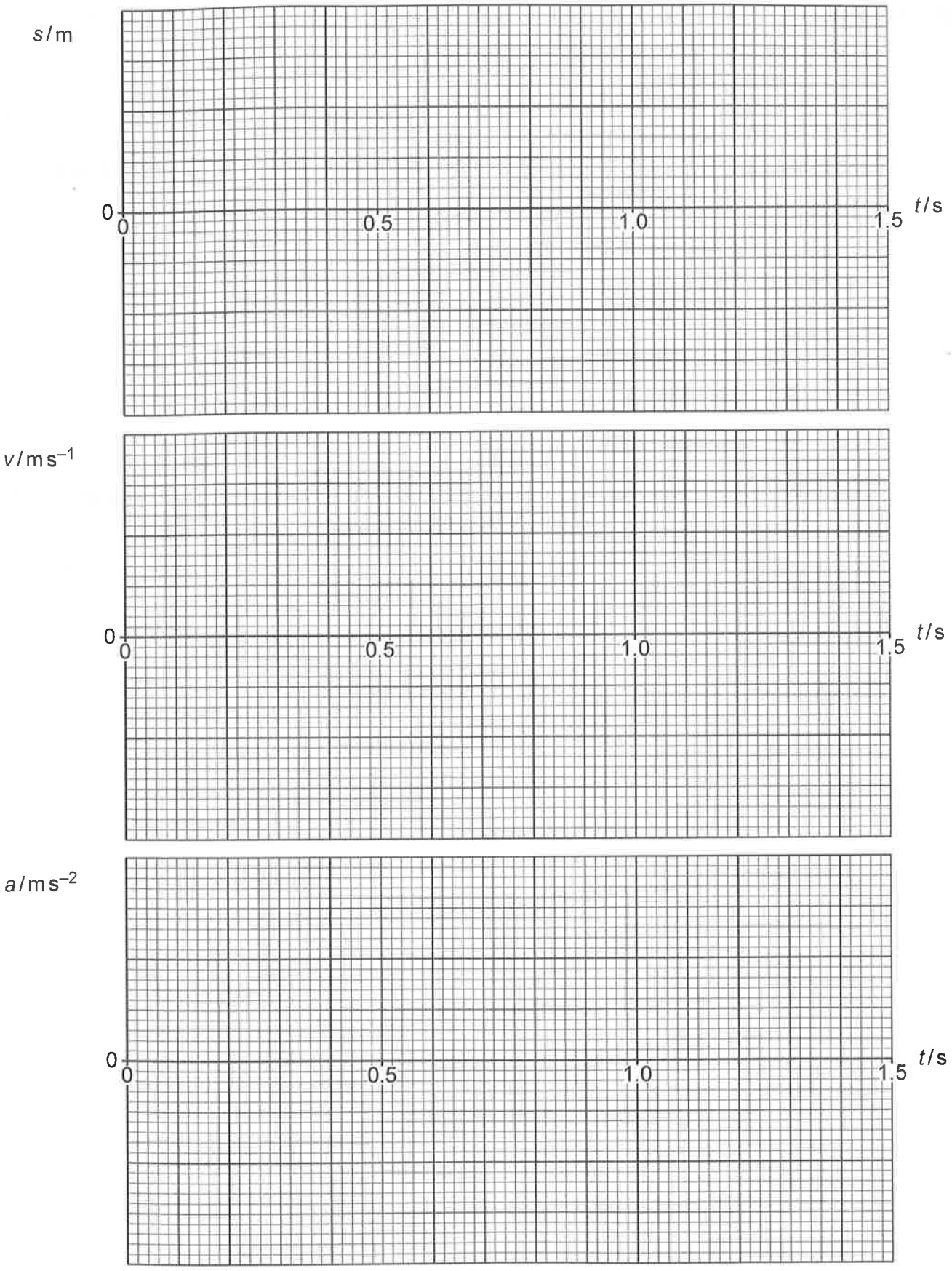

Fig. 2.1

[5]

[Total: 9]