2 **(a)** Define *acceleration*.

.....

..... [1]

(b) A stone falls vertically from the top of a cliff. Fig. 2.1 shows the variation with time t of the velocity v of the stone.

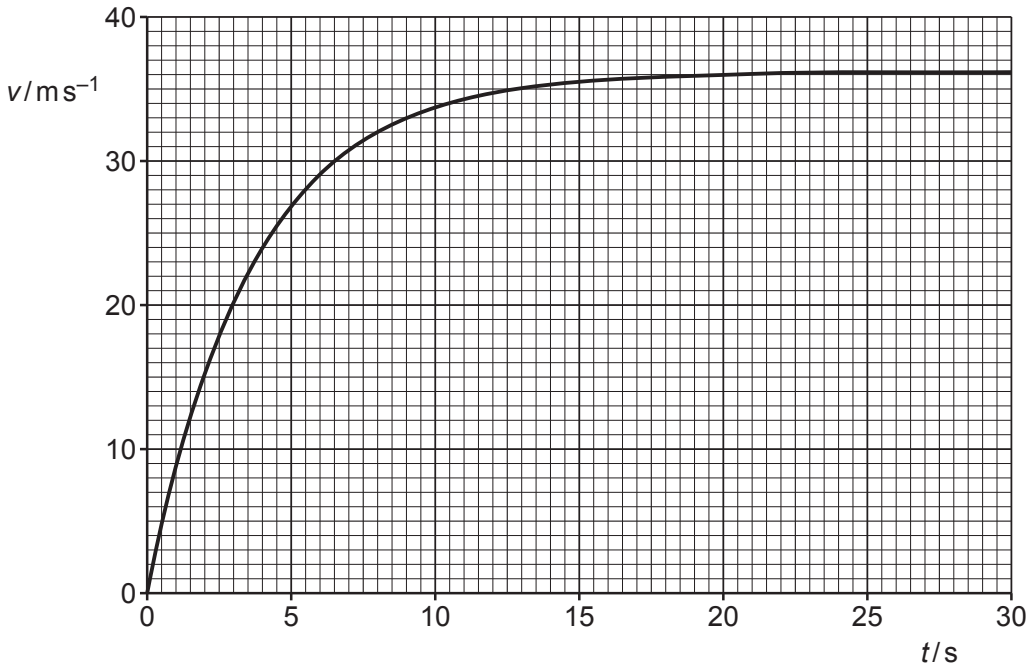

Fig. 2.1

(i) Explain, with reference to forces acting on the stone, the shape of the curve in Fig. 2.1.

.....

.....

.....

.....

..... [3]

(ii) Use Fig. 2.1 to determine the speed of the stone when the resultant force on it is zero.

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

(iii) Use Fig. 2.1 to calculate the approximate height through which the stone falls between $t = 0$ and $t = 30\,s$.

height = ... m [3]

(iv) On Fig. 2.2, sketch the variation with t of the acceleration a of the stone between $t = 0$ and $t = 30\,s$.

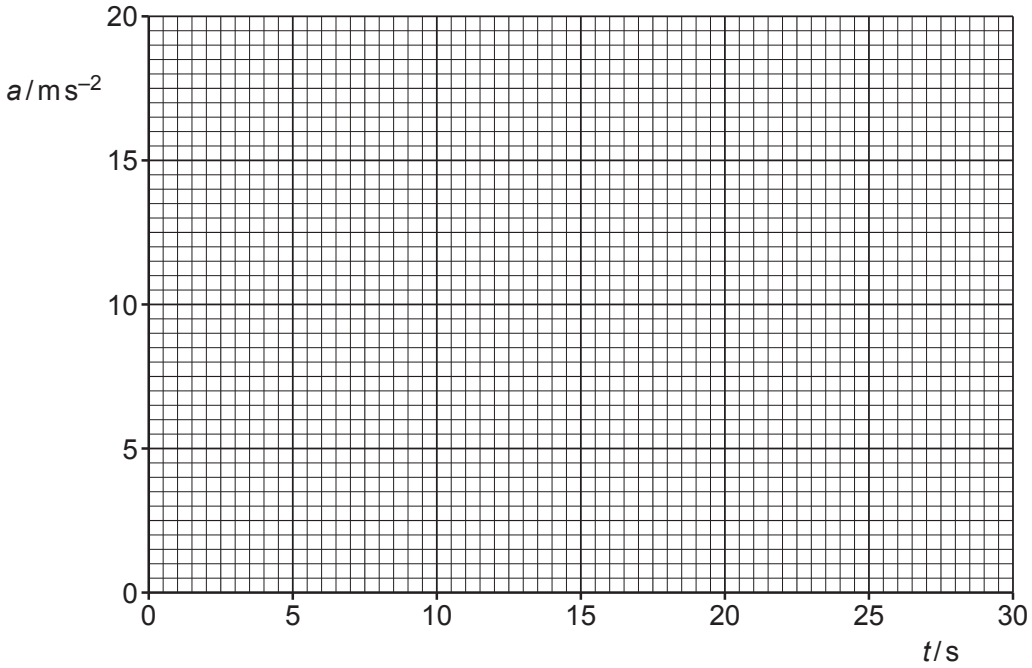

Fig. 2.2

[3]

[Total: 11]