Oxford Cambridge and RSA

# A Level Physics A

## H556/01 Modelling physics

## Question Set 25

**1** A bicycle manufacturer carries out tests on the braking system of their new model.
A cyclist on this new bicycle travels at a constant initial speed $U$.
The cyclist applies the brakes at time $t = 0$ and the bicycle comes to a stop at time $t = 2.0$ s.

Fig. 20.1 shows the variation of the braking force $F$ on the bicycle with time $t$.

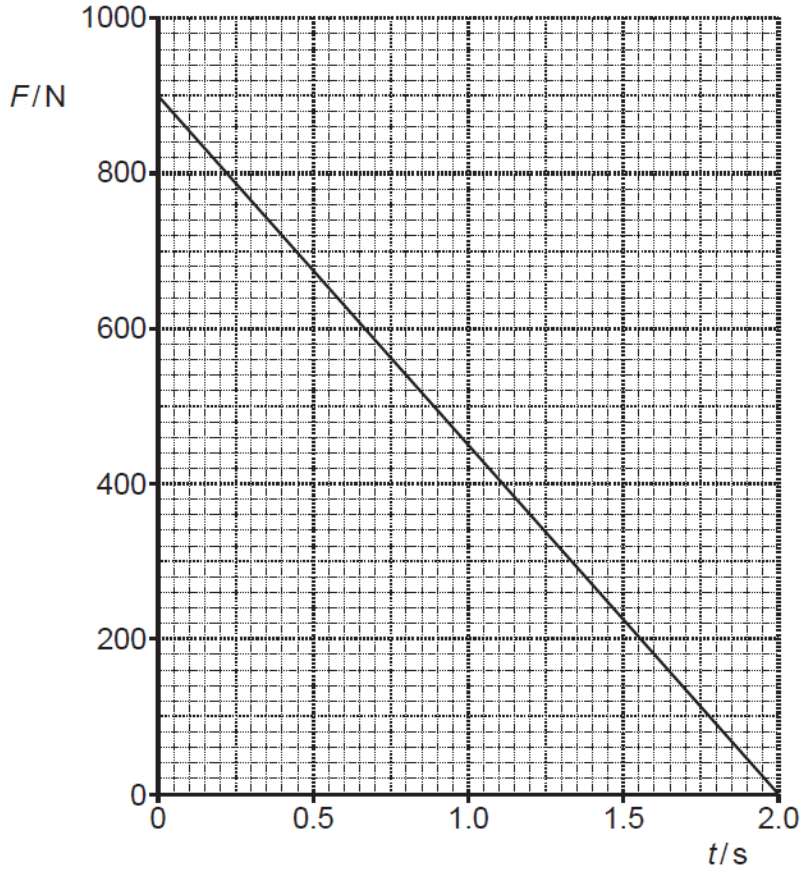


**Fig. 20.1**

**(a)** Use Newton's second law of motion to explain the physical quantity represented by the area under the graph shown in Fig. 20.1. **[2]**

**(b)** The total mass of cyclist and bicycle is 71 kg.

Use Fig. 20.1 to calculate the initial speed $U$.

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

**(c)** Complete Fig. 20.2 to show the variation of the speed of the bicycle from $t = 0$ to $t = 2.0\,s$.

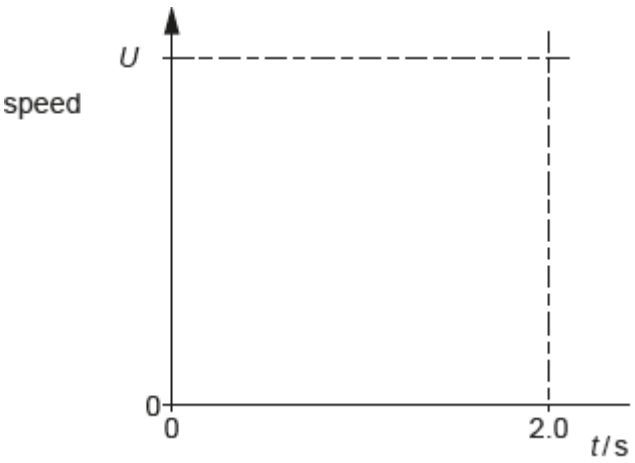


**Fig. 20.2**

**[2]**

## Total Marks for Question Set 25: 6

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