

- 2 A car is travelling along a straight road at speed  $v$ . A hazard suddenly appears in front of the car. In the time interval between the hazard appearing and the brakes on the car coming into operation, the car moves forward a distance of 29.3 m. With the brakes applied, the front wheels of the car leave skid marks on the road that are 12.8 m long, as illustrated in Fig. 2.1.



**Fig. 2.1**

It is estimated that, during the skid, the magnitude of the deceleration of the car is  $0.85g$ , where  $g$  is the acceleration of free fall.

**(a)** Determine

- (i)** the speed  $v$  of the car before the brakes are applied,

$$v = \dots\dots\dots \text{ms}^{-1} \quad [2]$$

- (ii)** the time interval between the hazard appearing and the brakes being applied.

$$\text{time} = \dots\dots\dots \text{s} \quad [2]$$

- (b) The legal speed limit on the road is 60 km per hour.  
Use both of your answers in (a) to comment on the standard of the driving of the car.

*For  
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Use*

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