

- 1 A car of mass 1700 kg travels over a curved hump in the road as shown in Fig. 1.1. The radius of curvature of the hump is 45 m.



Fig. 1.1

- (a) The speed of the car at the top of the hump is 19 m s^{-1} .

Determine, for the car at the top of the hump,

- (i) the magnitude of the centripetal force acting on the car,

$$\text{centripetal force} = \dots \text{N} \quad [1]$$

- (ii) the magnitude of the normal contact force exerted by the road on the car.

$$\text{normal contact force} = \dots \text{N} \quad [2]$$

- (b) Determine the maximum speed v_{max} that the car can travel at without losing contact with the top of the hump. Explain your working.

$$v_{max} = \dots \text{ m s}^{-1} \quad [3]$$