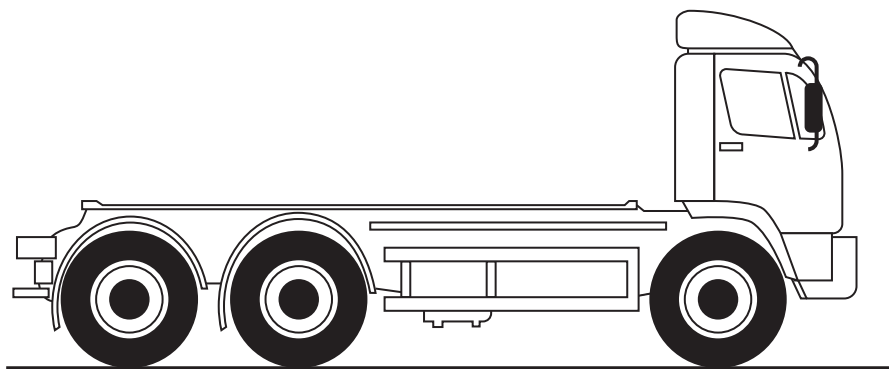


- 8 The diagram shows a lorry with a curved roof.



- (a) Give a reason why the roof is shaped in this way.

(1)

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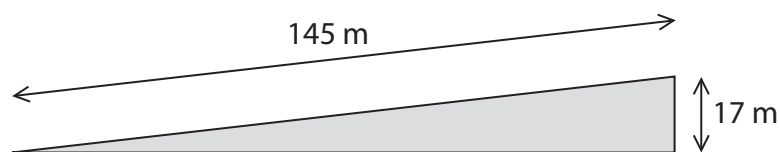
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- (b) The lorry travels up a hill at a constant speed.

The diagram shows the dimensions of the hill.



- (i) State the relationship between work done, force and distance moved in the direction of the force.

(1)

- (ii) The weight of the lorry is 180 kN.

Calculate the work done against gravity by the lorry in moving to the top of the hill.

(3)

work done = ..... J

- (iii) The lorry takes 8.0 s to travel up the hill.

Calculate the useful power of the lorry.

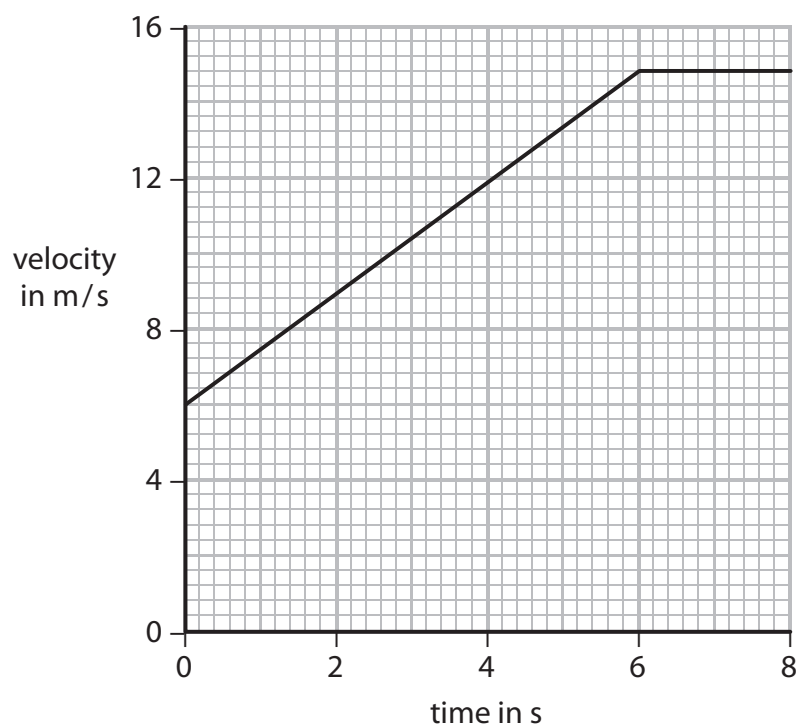
Give the unit.

(3)

useful power = ..... unit .....



(c) The graph shows part of another journey.



The lorry accelerates and then travels at a constant velocity.

(i) State the relationship between acceleration, change in velocity and time.

(1)

(ii) Calculate the acceleration of the lorry during the first 6 s.

(2)

acceleration = .....  $\text{m/s}^2$

(iii) Calculate the distance travelled during the 8 s shown on the graph.

(3)

distance = ..... m



(d) The lorry has 6 tyres.

(i) State the relationship between pressure, force and area.

(1)

(ii) The pressure in each tyre is 240 kPa.

The weight of the lorry is 180 kN.

Calculate the area of each tyre that is in contact with the road.

(4)

area = ..... m<sup>2</sup>

**(Total for Question 8 = 19 marks)**

