



- 
- This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

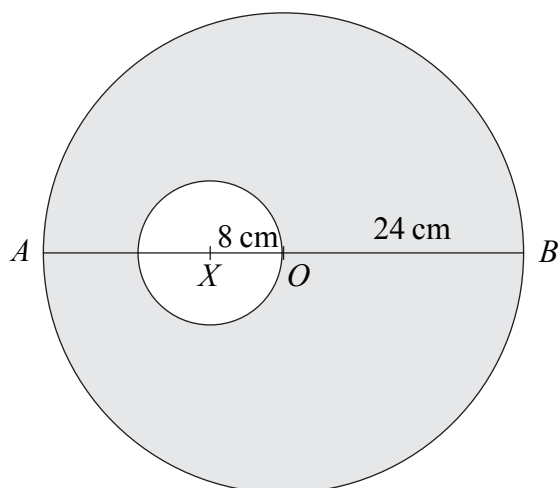
- (a) Find, in kW, the rate of working of the engine of the car.

When the car is travelling down the road at  $15 \text{ m s}^{-1}$ , the engine is switched off. The car comes to rest in time  $T$  seconds after the engine is switched off. The resistance to motion from non-gravitational forces is again modelled as a constant force of magnitude  $900 \text{ N}$ .

- (b) Find the value of  $T$ .

(4)

### Figure 1



(a) Find  $AG$ .

(6)

(b) find the mass of  $T$  in terms of  $m$ .

(4)

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### Question 3 continued

### Q3

**(Total 10 marks)**



- (a) Find, in terms of  $v$  only, the speed of  $P$  before the collision.

(3)

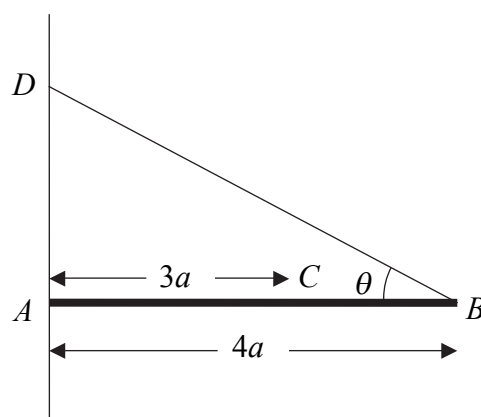
- (3)

(c) the coefficient of restitution between  $Q$  and  $R$  is  $\frac{3}{4}$ ,

(4)

- (2)

### Figure 2



(a) Find the tension in the string.

(5)

**(3)**

(c) find the value of  $\mu$ .

(4)

[illegible]

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blank**Question 5 continued****Q5****(Total 12 marks)**

N 2 3 5 5 9 A 0 1 1 1 6



- (a) Find the acceleration of  $P$  at time  $t$  seconds.

(2)

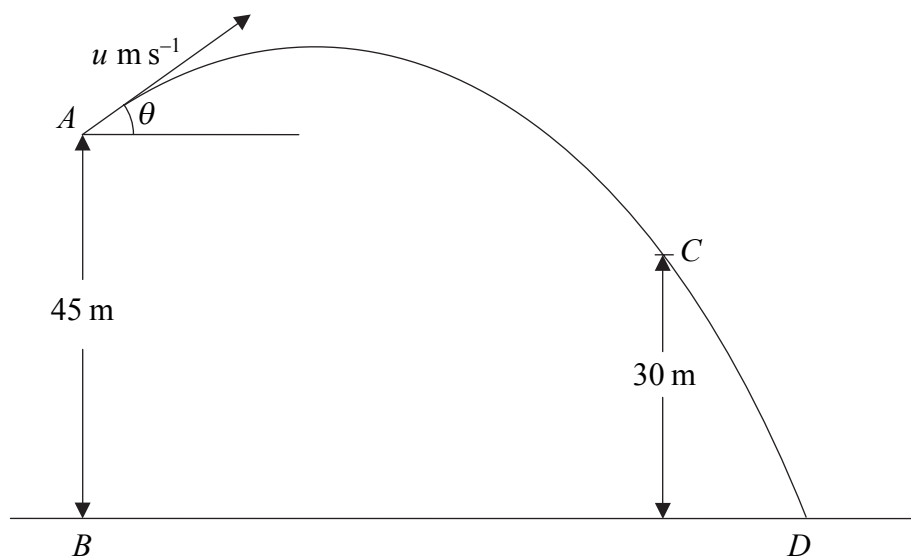
- (5)

(c) the magnitude of  $\mathbf{Q}$ ,

(3)

- (3)**

### Figure 3



Given that  $P$  passes through  $C$  with speed  $24.5 \text{ m s}^{-1}$ ,

- (a) using conservation of energy, or otherwise, show that  $u = 17.5$ , (4)
- (b) find the size of the angle which the velocity of  $P$  makes with the horizontal as  $P$  passes through  $C$ , (3)
- (c) find the distance  $BD$ . (7)



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**Question 7 continued**



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**Question 7 continued**

**(Total 14 marks)**

**TOTAL FOR PAPER: 75 MARKS**

**END**

