

Circular Measure

Question Paper

Level	Pre U
Subject	Maths
Exam Board	Cambridge International Examinations
Topic	Circular Measure
Booklet	Question Paper

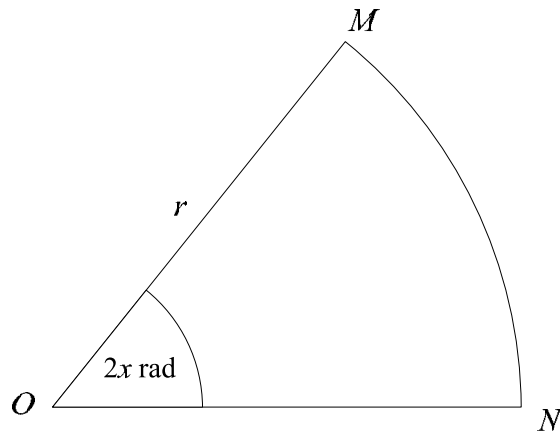
Time Allowed: 32 minutes

Score: /27

Percentage: /100

Grade Boundaries:

1



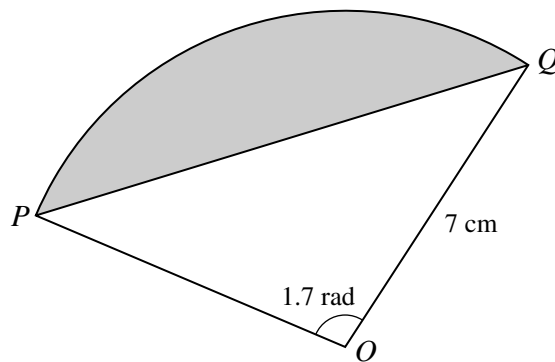
The diagram shows a sector of a circle, OMN . The angle MON is $2x$ radians, the radius of the circle is r and O is the centre.

(i) Find expressions, in terms of r and x , for the area, A , and the perimeter, P , of the sector. [2]

(ii) Given that $P = 20$, show that $A = \frac{100x}{(1+x)^2}$. [2]

(iii) Find $\frac{dA}{dx}$, and hence find the value of x for which the area of the sector is a maximum. [5]

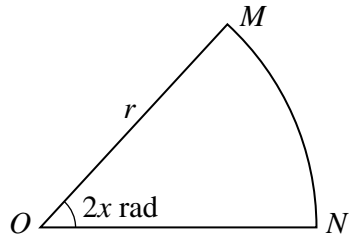
2 A sector, POQ , of a circle centre O has radius 7 cm and angle 1.7 radians (see diagram).



(i) Find the length of the line PQ . [3]

(ii) Hence find the perimeter of the shaded area. [2]

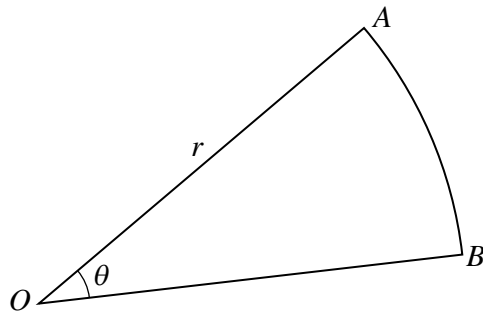
3



The diagram shows a sector of a circle, OMN . The angle MON is $2x$ radians, the radius of the circle is r and O is the centre.

- (i) Find expressions, in terms of r and x , for the area, A , and perimeter, P , of the sector. [2]
- (ii) Given that $P = 20$, show that $A = \frac{100x}{(1+x)^2}$. [2]
- (iii) Find $\frac{dA}{dx}$, and hence find the value of x for which the area of the sector is a maximum. [5]

4



The diagram shows a sector OAB of a circle with centre O and radius r cm in which angle AOB is θ radians. The sector has a perimeter of 18 cm.

- (i) Show that $\theta = \frac{18-2r}{r}$. [2]
- (ii) Find the area of the sector in terms of r , simplifying your answer. [2]