Trigonometry – A2 Mathematics P1
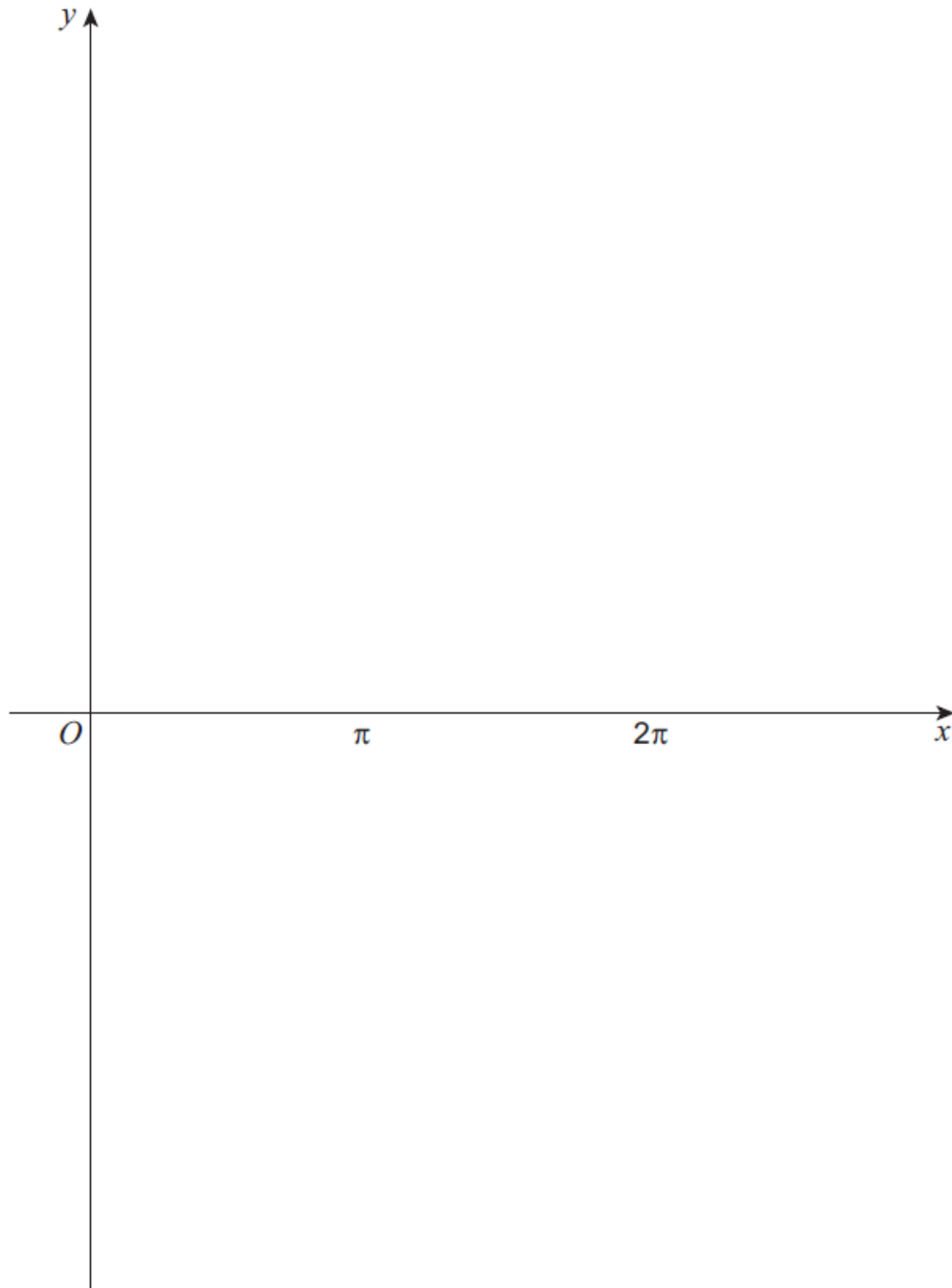
1. June/2022/Paper_7357/01/No.7

   Sketch the graph of

$$y = \cot\left(x - \frac{\pi}{2}\right)$$
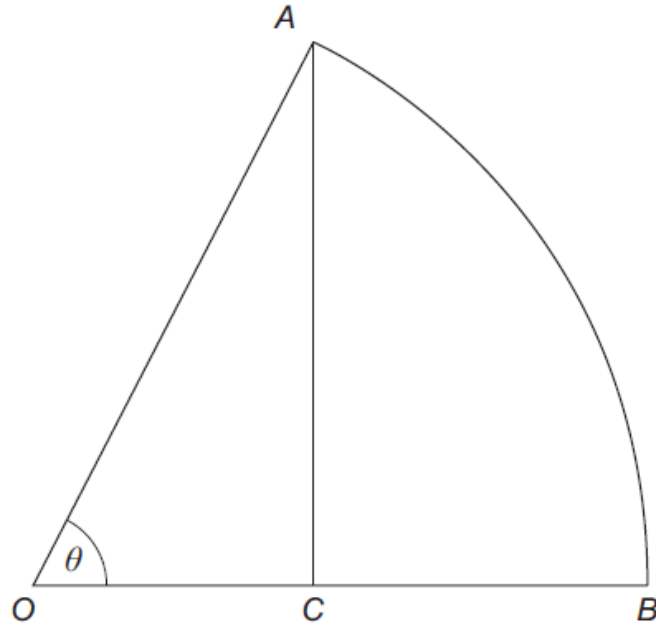
   for $0 \le x \le 2\pi$

   [3 marks]

2. June/2022/Paper_7357/01/No.10(a)

The diagram shows a sector of a circle *OAB*.

The point *C* lies on *OB* such that *AC* is perpendicular to *OB*.

Angle *AOB* is θ radians.

(a) Given the area of the triangle *OAC* is half the area of the sector *OAB*, show that

$$\theta = \sin 2\theta$$

[4 marks]

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2. June/2022/Paper_7357/01/No.10(a)

3. June/2022/Paper_7357/01/No.15(a)

(a)   Given that

$$y = \operatorname{cosec} \theta$$

(a) (i)   Express y in terms of $\sin \theta$.

[1 mark]

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(a) (ii)   Hence, prove that

$$\frac{dy}{d\theta} = -\operatorname{cosec} \theta \cot \theta$$

[3 marks]

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(a) (iii) Show that

$$\frac{\sqrt{y^2 - 1}}{y} = \cos\theta \qquad \text{for } 0 < \theta < \frac{\pi}{2}$$

[3 marks]

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