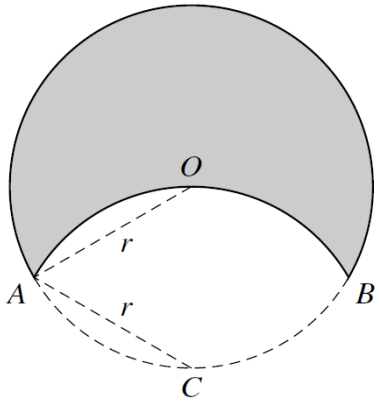
Circular Measure– 2023 AS Mathematics 9709

1. Nov/2023/Paper_9709/11/No.6



The diagram shows a motif formed by the major arc AB of a circle with radius r and centre O, and the minor arc AOB of a circle, also with radius r but with centre C. The point C lies on the circle with centre O.

(a) Given that angle $ACB = k\pi$ radians, state the value of the fraction k. [1]

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(b) State the perimeter of the shaded motif in terms of π and r. [1]

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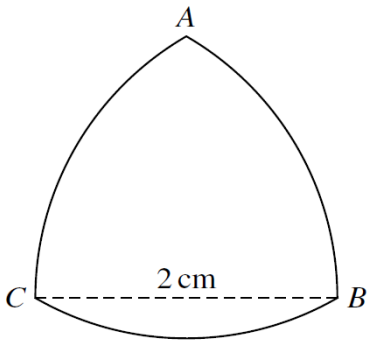
(c) Find the area of the shaded motif, giving your answer in terms of π, r and $\sqrt{3}$. [5]

2. Nov/2023/Paper_9709/12/No.4



The diagram shows the shape of a coin. The three arcs AB, BC and CA are parts of circles with centres C, A and B respectively. ABC is an equilateral triangle with sides of length 2 cm.

(a) Find the perimeter of the coin. [2]

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(b) Find the area of the face ABC of the coin, giving the answer in terms of π and $\sqrt{3}$. [4]

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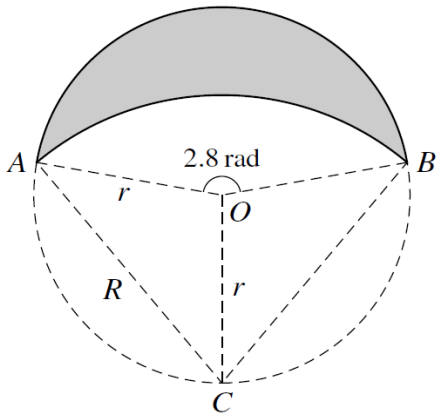
3. Nov/2023/Paper_9709/13/No.10



The diagram shows points A, B and C lying on a circle with centre O and radius r. Angle AOB is 2.8 radians. The shaded region is bounded by two arcs. The upper arc is part of the circle with centre O and radius r. The lower arc is part of a circle with centre C and radius R.

(a) State the size of angle ACO in radians. [1]

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(b) Find R in terms of r. [1]

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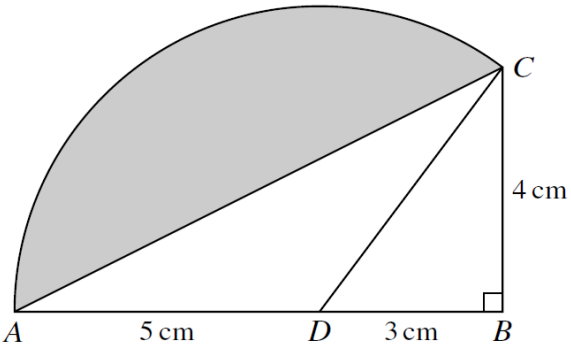
(c) Find the area of the shaded region in terms of r. [7]

4. March/2023/Paper_9709/12/No.8



The diagram shows triangle ABC in which angle B is a right angle. The length of AB is 8 cm and the length of BC is 4 cm. The point D on AB is such that $AD = 5$ cm. The sector DAC is part of a circle with centre D.

(a) Find the perimeter of the shaded region. [5]

(b) Find the area of the shaded region. [3]