Unit 12 · Circle

HARDER WORKSHEET

Full marks 23

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 23

1 Work backwards [3]

Solve the following problem. Show your working.

An inscribed angle ACB is $(2x + 20)^\circ$, and the reflex central angle AOB on the same arc is $(5x - 10)^\circ$. Find x, both angles, and the angle AOB on the other arc.

Answer: _____

2 Angles from arcs [3]

Solve the following problem. Show your working.

The corners of $\triangle ABC$ are on a circle, and they cut the circle into the arcs AB, BC and CA in the ratio 2 : 3 : 4 (each arc not containing the third corner). Find the three angles of the triangle.

Answer: _____

3 Is it possible? [2]

Answer with reasons.

Gita measured the angles of a quadrilateral in order round it as 100°, 80°, 70° and 110°. Could its four corners lie on one circle? And for 100°, 70°, 80°, 110° in that order?

4 Show it [8]

Prove the following. Write each statement with its reason.

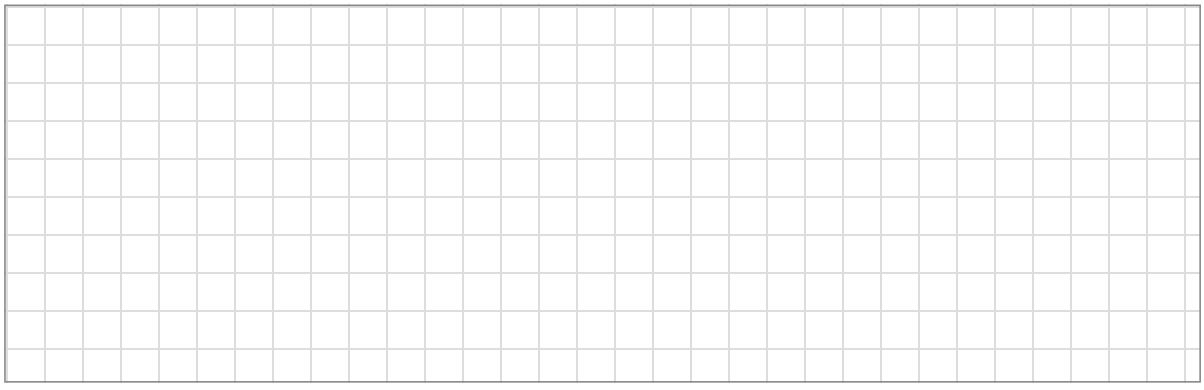
a. $ABCD$ is a cyclic quadrilateral with $AB \parallel DC$. Prove that $AD = BC$ (a trapezium in a circle is isosceles). Draw the figure. [4]

b. The chords AB and CD of a circle cross at E inside it. Prove that $\angle AEC \triangleq \frac{1}{2}(\text{arc } AC + \text{arc } BD)$, the arcs between the arms of the angle and of its vertically opposite angle. Draw the figure. [4]

5 In a real setting [3]

Solve the following problem. Show your working.

A class stands in a straight row 8 m long. A camera that takes in exactly 90° must be placed so that the row just fills the picture. Describe every place it can stand, and find the greatest distance it can be from the row.



Answer: _____

6 Make your own [2]

Answer the following question.

With a pair of compasses, a ruler and a protractor, explain how to draw a circle with an inscribed angle of exactly 35°.

7 Think [2]

Think, then answer.

P is a point inside a circle, not on it, and AB is a chord. Is $\angle APB$ bigger or smaller than an inscribed angle ACB on the same side of AB? Explain.