Year 10A extension | Space

Circle geometry and proof

Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Use circle theorems with stated arc conditions and justify angle relationships.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

Angles at the circumference subtended by the same chord on the same side of that chord are equal. A central angle is twice the circumference angle standing on the same arc. In particular, an angle in a semicircle is 90 degrees.

Opposite angles in a cyclic quadrilateral sum to 180 degrees. A radius to a point of tangency is perpendicular to the tangent. Equal tangent lengths from an external point can be justified by congruent right triangles formed using the radii and the line to the centre.

Worked example

Points A, B and C lie on a circle with centre O. The minor central angle AOB is 100 degrees and C lies on the major arc AB. Find angle ACB.

The two angles stand on the same minor arc AB.

The angle at the circumference is half the central angle.

Answer: 50 degrees

Try it yourself

Name: _____ Date: _____

1. A central angle is 136 degrees. Find a circumference angle standing on the same arc.

2. AB is a diameter and C is another point on the circle. Find angle ACB.

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. 68 degrees

Use half the central angle.

2. 90 degrees

An angle standing on a diameter is an angle in a semicircle.

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