

Exercise walk-through

4.1.3

Bearings

AQA · GCSE · Mathematics

80. Circle parts and geometric definitions · Foundation

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For centre O and radius 5 cm, every circumference point is 5 cm from O and the diameter is 10 cm. A chord 3 cm from O has half-length $\sqrt{(5^2-3^2)}=4$ cm, so its whole length is 8 cm. The perpendicular from O meets the chord at its midpoint. Joining the two chord endpoints to O creates a sector; the smaller region between chord and arc is a segment. At the rightmost circumference point, the vertical touching line is tangent and the horizontal radius is perpendicular to it. The circumference is a length, $2\pi r=10\pi$ cm, rather than an area.

99. Measuring angles and three-figure bearings · Foundation

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From A to B the bearing 070° is 70° clockwise from north. From B to A it is $070+180=250^\circ$. A bearing of 320° reverses to $500-360=140^\circ$. East is 090° , not 90 without its three-digit form. A route bearing 120° points southeast of the starting point, making 30° below east. On a 1:10000 map, a 3 cm route represents 300 m; to construct bearing 120° , place the protractor centre at the route start, align its zero with north and measure clockwise. Keep the ruler scale and angular direction as separate decisions.

118. Tangents, chords and the alternate segment · Higher

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At contact T, the radius OT is perpendicular to the tangent: a non-perpendicular line through T would have a smaller centre-to-line distance than the radius and cut the circle twice. For tangents PA and PB, $OA=OB$, OP is shared and both contact angles are 90° . RHS makes OAP and OBP congruent, so $PA=PB$. For a centre perpendicular OM to chord AB, $OA=OB$ and OM is shared; RHS gives $AM=MB$. If $OA=5$ and $OM=3$, $AM=4$, hence $AB=8$. For a chord AB with minor central angle ϕ , triangle OAB has base angle $(180-\phi)/2$.

Exercises 2.1·2.3

2.1 (Foundation) Find the reverse bearing of 070° .

2.2 (Foundation) Find the reverse bearing of 320° .

2.3 (Foundation) Give the bearing of southeast in degrees.

3 Exam-style questions

Exercises 2.1·2.3

2.1 (Foundation) Find the reverse bearing of 070° .

2.1 $070 + 180 = 250^\circ$.

2.2 (Foundation) Find the reverse bearing of 320° .

2.2 $320 + 180 = 500$; subtract 360.

2.3 (Foundation) Give the bearing of southeast in degrees.

3 Exam-style questions

2.3 Southeast is halfway from east 090° to south 180° .

Exercise 3.1

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The reverse bearing of 070° is 290° .

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3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: The reverse bearing of 070° is 290° .

3.1 False. Add 180° modulo 360° : $070^\circ + 180^\circ = 250^\circ$. A reverse bearing describes the opposite direction.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.