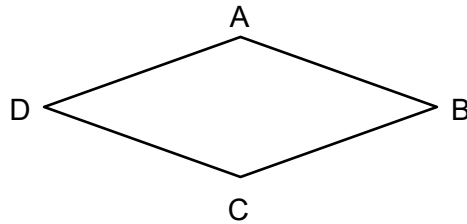


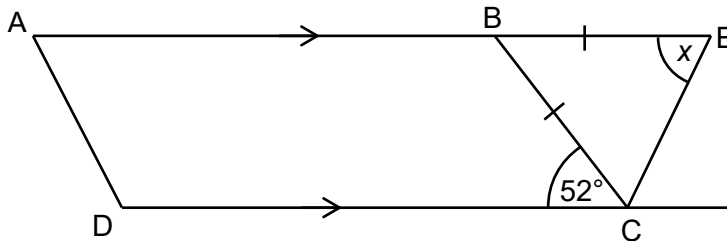
Higher Check In - 8.04 Properties of polygons

1. Triangle PQR is isosceles with $PR = QR$. Angle $PQR = 57^\circ$. Find angle QRP.
2. ABCD is a rhombus. If $\angle ADB = 18^\circ$, calculate the size of $\angle ACB$.



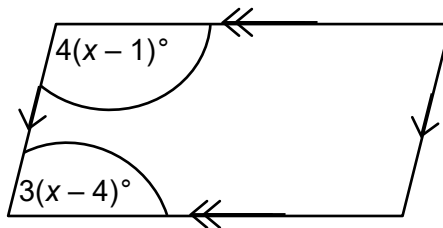
Not to scale

3. Find the size of angle x in the diagram below.



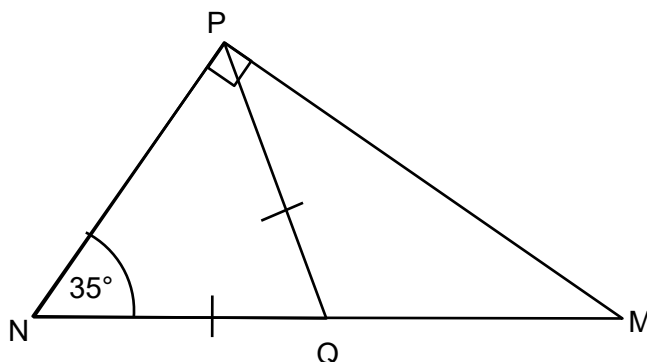
Not to scale

4. In a triangle, the first angle is a right angle and the second angle is 5 times the size of the third angle. Find the size of all three angles.
5. Work out the size of each angle in the quadrilateral below.



Not to scale

6. Show that triangle MPQ is isosceles.

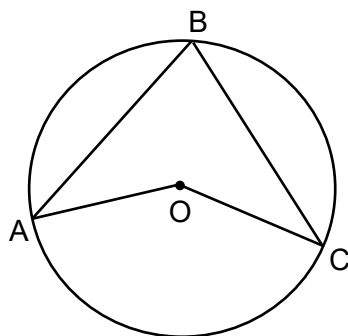


Not to scale



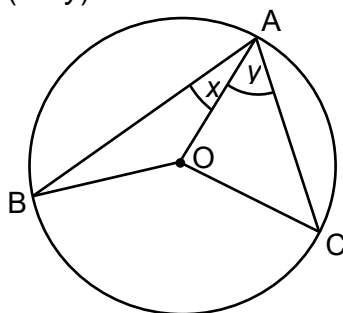
GCSE (9-1) MATHEMATICS

7. A, B and C are points on the circumference of a circle, centre O.
Given that the $\angle BAO = \angle BCO$, prove that $AB = BC$.



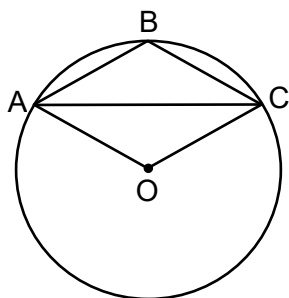
Not to scale

8. Points A, B and C are on the circumference of the circle, centre O.
By considering the triangles OAB and OAC, prove that the obtuse angle $BOC = 2(x + y)$.



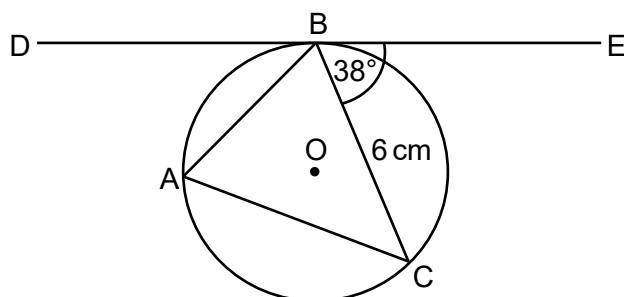
Not to scale

9. Points A, B and C are on the circumference of the circle, centre O.
Given that $AB = OC$, find the value of angle OAC.



Not to scale

10. Points A, B and C are on the circumference of the circle, centre O.
None of the chords AB, AC or BC go through the centre of the circle.
DE is a tangent and touches the circle at point B.
Find the length of the radius of the circle.



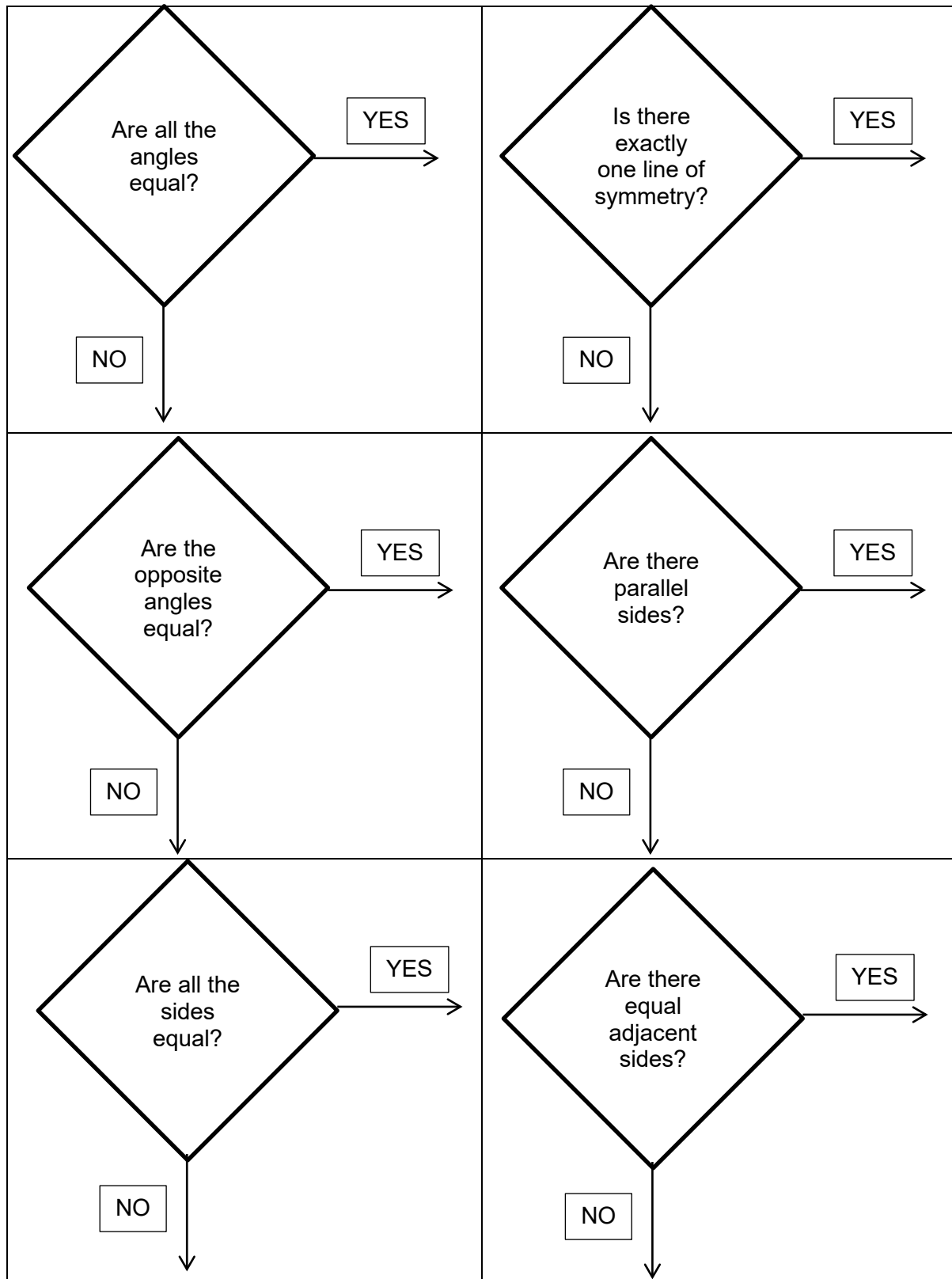
Not to scale



GCSE (9-1) MATHEMATICS

Extension

Cut out and arrange the decision boxes to form a flow chart for distinguishing between quadrilaterals (square, parallelogram, trapezium, rectangle, kite, rhombus and non-specific general quadrilateral).



GCSE (9-1) MATHEMATICS

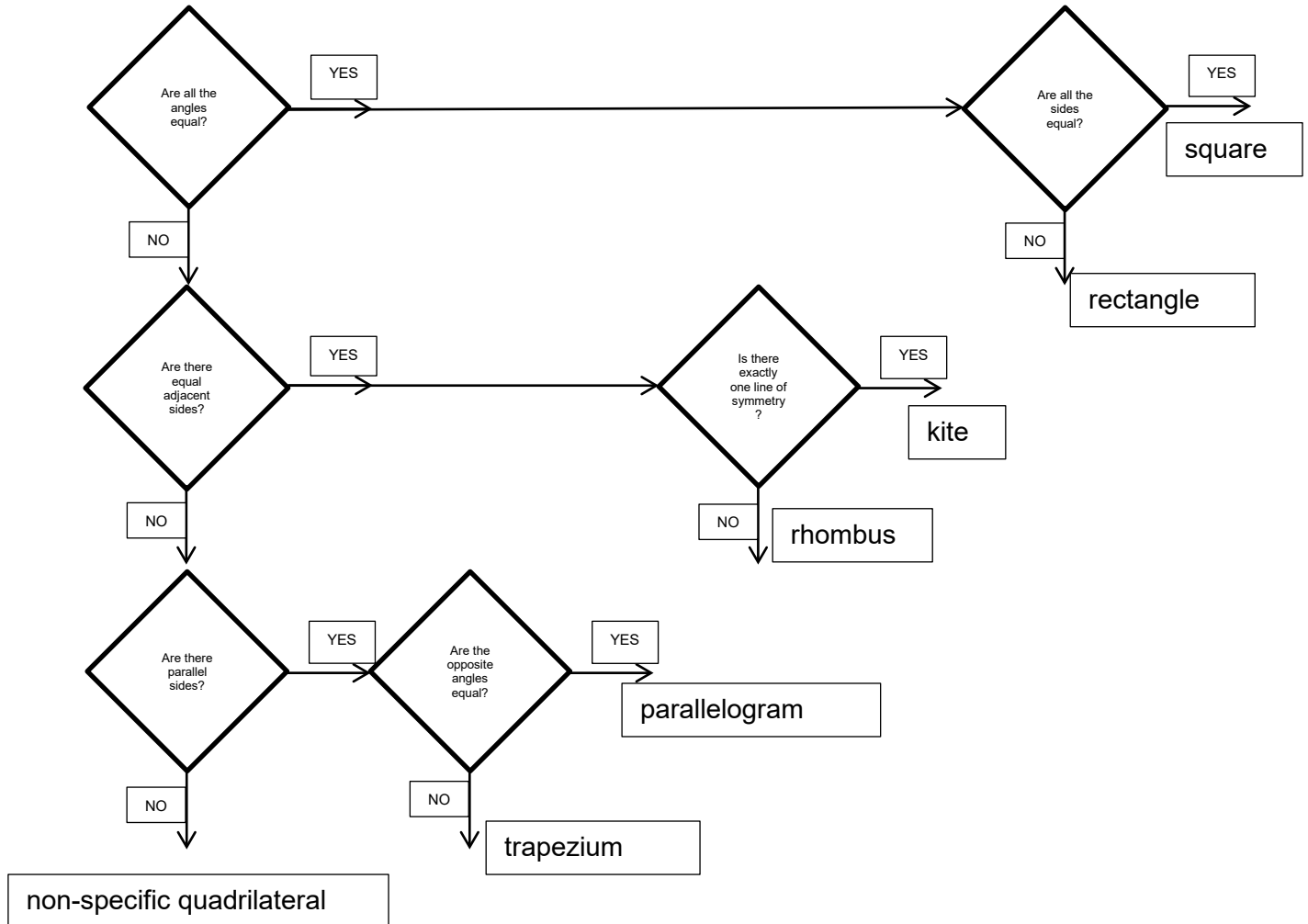
Answers

1. 66°
2. 72°
3. $x = 64^\circ$
4. 90° , 15° and 75°
5. 72° , 108° , 72° , 108°
6. Given that $\angle NQP = \angle QPN = 35^\circ \therefore \angle NQP = 180 - (35 + 35) = 110^\circ$
(sum of angles in a triangle is 180°).
Given that $\angle NPM = 90^\circ$, $\angle QPM = 90 - 35 = 55^\circ$ and
 $\angle NMP = 180 - (90 + 35) = 55^\circ$ (sum of angles in a triangle is 180°).
 $\angle QPM = \angle NMP \therefore$ triangle MPQ is isosceles.
7. $OA = OB = OC$ as they are radii of the circle
 \therefore triangles OAB and OBC are isosceles
 \therefore triangles OAB and OBC are congruent, SAS so $AB = BC$.
8. $OA = OB = OC$ as they are all radii of the circle
 \therefore triangles OAB and OAC are isosceles
 \therefore angle ABO = x because base angles of an isosceles triangle are equal.
Similarly angle ACO = y , because base angles of an isosceles triangle are equal.
Angle AOB = $180 - 2x$ because sum of angles in a triangle is 180° .
Similarly angle AOC = $180 - 2y$
 \therefore angle BOC = $360 - (180 - 2x) - (180 - 2y)$
 $= 2x + 2y$
 $= 2(x + y)$
9. Given $AB = OC$ and $OC = OA = OB$ (radii) then triangles AOB and BOC are equilateral triangles and ABCO is a rhombus.
 \therefore $\angle OAB = 60^\circ$ so $\angle CAB = 30^\circ$.
10. 4.87 cm



Extension

One possible arrangement:



We'd like to know your view on the resources we produce. By clicking on '[Like](#)' or '[Dislike](#)' you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

Whether you already offer OCR qualifications, are new to OCR, or are considering switching from your current provider/awarding organisation, you can request more information by completing the Expression of Interest form which can be found here:

www.ocr.org.uk/expression-of-interest

Looking for a resource? There is now a quick and easy search tool to help find free resources for your qualification:

www.ocr.org.uk/i-want-to/find-resources/

OCR Resources: *the small print*

OCR's resources are provided to support the teaching of OCR qualifications, but in no way constitute an endorsed teaching method that is required by the Board, and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources. We update our resources on a regular basis, so please check the OCR website to ensure you have the most up to date version.

© OCR 2016 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: Maths and English icons: AirOne/Shutterstock.com



Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Use the properties of an isosceles triangle to find an angle			
AO1	2	Use the properties of a rhombus to find an angle			
AO1	3	Use the properties of a trapezium and an isosceles triangle to find an angle			
AO1	4	Use the properties of a right-angled triangle to find an angle			
AO1	5	Use the properties of a parallelogram to find an angle			
AO2	6	Use the properties of an isosceles triangle in a simple proof			
AO2	7	Use the properties of triangles in a proof involving circle theorems			
AO2	8	Use the properties of triangles in a proof involving circle theorems			
AO3	9	Use the properties of triangles and quadrilaterals in circle theorems to find an angle			
AO3	10	Use the properties of triangles in circle theorems to find a length			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Use the properties of an isosceles triangle to find an angle			
AO1	2	Use the properties of a rhombus to find an angle			
AO1	3	Use the properties of a trapezium and an isosceles triangle to find an angle			
AO1	4	Use the properties of a right-angled triangle to find an angle			
AO1	5	Use the properties of a parallelogram to find an angle			
AO2	6	Use the properties of an isosceles triangle in a simple proof			
AO2	7	Use the properties of triangles in a proof involving circle theorems			
AO2	8	Use the properties of triangles in a proof involving circle theorems			
AO3	9	Use the properties of triangles and quadrilaterals in circle theorems to find an angle			
AO3	10	Use the properties of triangles in circle theorems to find a length			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Use the properties of an isosceles triangle to find an angle			
AO1	2	Use the properties of a rhombus to find an angle			
AO1	3	Use the properties of a trapezium and an isosceles triangle to find an angle			
AO1	4	Use the properties of a right-angled triangle to find an angle			
AO1	5	Use the properties of a parallelogram to find an angle			
AO2	6	Use the properties of an isosceles triangle in a simple proof			
AO2	7	Use the properties of triangles in a proof involving circle theorems			
AO2	8	Use the properties of triangles in a proof involving circle theorems			
AO3	9	Use the properties of triangles and quadrilaterals in circle theorems to find an angle			
AO3	10	Use the properties of triangles in circle theorems to find a length			

Assessment Objective	Qu.	Topic	R	A	G
AO1	1	Use the properties of an isosceles triangle to find an angle			
AO1	2	Use the properties of a rhombus to find an angle			
AO1	3	Use the properties of a trapezium and an isosceles triangle to find an angle			
AO1	4	Use the properties of a right-angled triangle to find an angle			
AO1	5	Use the properties of a parallelogram to find an angle			
AO2	6	Use the properties of an isosceles triangle in a simple proof			
AO2	7	Use the properties of triangles in a proof involving circle theorems			
AO2	8	Use the properties of triangles in a proof involving circle theorems			
AO3	9	Use the properties of triangles and quadrilaterals in circle theorems to find an angle			
AO3	10	Use the properties of triangles in circle theorems to find a length			

