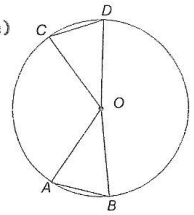
REVISION FOR T2W1 ASSESSMENT TASK
Circle Geometry

(a)

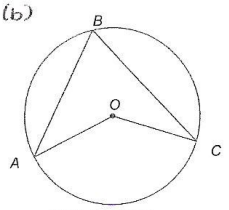


If $\angle AOB = \angle COD$ then:

arcAB = arc CD and
chord AB = chord CD

Circle Geometry Result No.

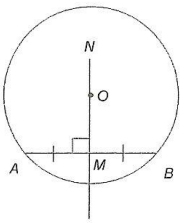
(b)



$\angle AOC = 2x\angle ABC$

Circle Geometry Result No.

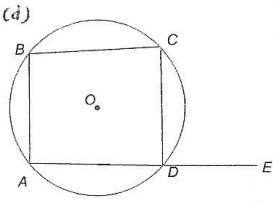
(c)



If AM = MB and $MN \perp AB$ then NM passes through O.

Circle Geometry Result No.

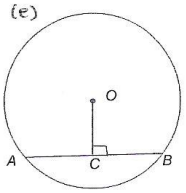
(d)



$\angle B = \angle CDE$

Circle Geometry Result No.

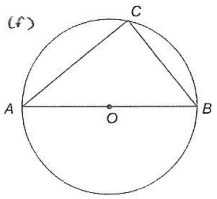
(e)



If $\angle OCB = \angle OCA$ then AC = BC

Circle Geometry Result No.

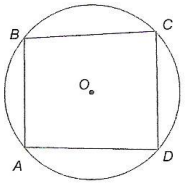
(f)



If AB is a diameter then $\angle ACB = 90°$

Circle Geometry Result No.

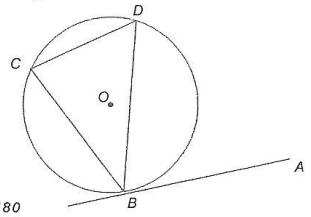
(g)



$\angle B + \angle D = 180°$ and $\angle C + \angle A = 180$

Circle Geometry Result No.

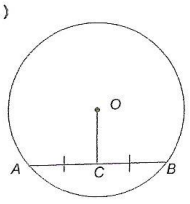
(h)



$\angle DA = \angle BCD$

Circle Geometry Result No.

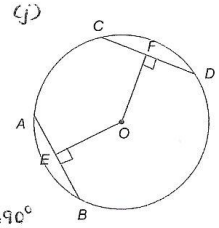
(i)



If AC = BC then $\angle OCB = \angle OCA = 90°$

Circle Geometry Result No.

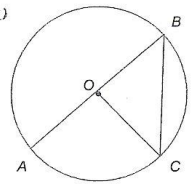
(j)



If AB = CD then OE = OF

Circle Geometry Property No.

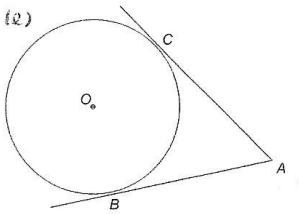
(k)



$\angle AOC = 2 \times \angle ABC$

Circle Geometry Result No.

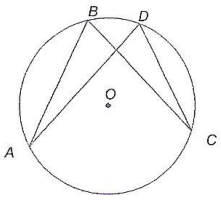
(l)



AB and AC are tangents to the circle from the same external point hence AC = AC

Circle Geometry Result No.

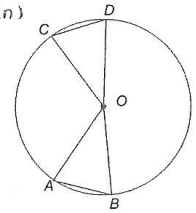
(m)



$\angle ABC = \angle ADC$

Circle Gemetry Result No.

(n)

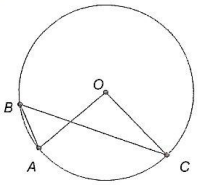


If arcAB = arc CD or
chord AB = chord CD

then $\angle AOB = \angle COD$

Circle Geometry Result No.

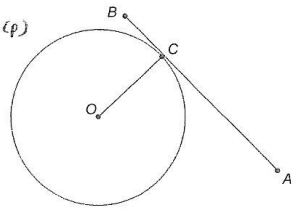
(o)



$\angle AOC = 2 \times \angle ABC$

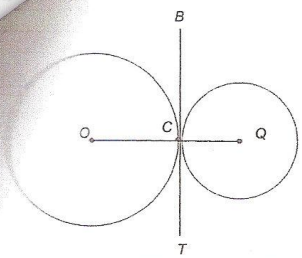
Circle Geometry Result No.

(p)



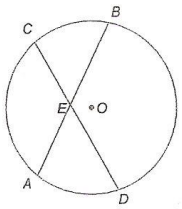
If OC is a radius and AB is a tangent meeting the circle at C then $\angle OCA = 90°$

Circle Geometry Result No.



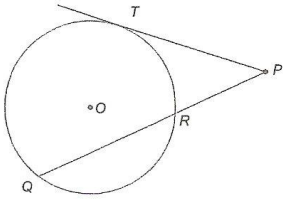
Line of centres OQ passes through C the point of contact of tangent BT

Circle Geometry Result No.



$AE \times EB = DE \times EC$

Circle Geometry Result No.



$PT^2 = QP \times PR$

Circle Geometry Result No.

Circle Geometry Results

1. Equal angles at the centre stand on equal chords and equal arcs.
2. Equal chords (or arcs) subtend equal angles at the centre.
3. A line from the centre which is perpendicular to a chord, bisects the chord.
4. A line from the centre which bisects a chord is perpendicular to the chord.
5. Equal chords are equidistant from the centre.
6. The perpendicular bisector of a chord of a circle must pass through the centre of the circle.
7. Angles in the same segment are equal.
8. Angle in a semi-circle is a right angle.
9. The angle at the centre is double the angle at the circumference standing on the same arc.
10. Opposite angles in a cyclic quadrilateral are supplementary.
11. The exterior angle of a cyclic quadrilateral is equal to the interior opposite angle.
12. The products of intercepts of intersecting chords are equal.
13. When circles touch, the line of centres passes through the point of contact.
14. The angle between a tangent and a radius drawn to the point of contact is a right angle.
15. Tangents drawn from the same external point are equal.
16. The square of the length of the tangent is equal to the product of the intercepts of a secant drawn from an external point.
17. An angle formed by a tangent to a circle with a chord drawn to the point of contact is equal to any point in the alternate segment.

Key points

Hints on answering questions

- Always draw a clear diagram and mark on the diagram all given information.
- Work from the known towards the desired result.
- If an angle is required, mark sizes of angles on the diagram as you find them. If it is a deductive question it is generally useful to label one of the angles with a pronumeral (one of the angles in the result).
- If sides are involved, consider isosceles triangles or congruent triangles.
- If you become lost, check that all given information has been used.
- Use any hints given in the question.

SOLUTIONS (Working across)

(a) 1	(b) 9	(c) 6	
(d) 11	(e) 3	(f) 8	
(g) 10	(h) 17	(i) 4	
(j) 5	(k) 9	(l) 15	
(m) 7	(n) 2	(o) 9	
(p) 14	(q) 13	(r) 12	(s) 16

Summary of circle properties

(proofs not required)

- **Definition** of circle, centre, radius, diameter, arc, sector, segment, chord, tangent, concyclic points, cyclic quadrilateral, subtend.
- **Two circles touch** if they have a common tangent at the point of contact.
- **Equal arcs on equal circles** subtend equal angles at the centre (and the converse).
- **The angle at the centre** is twice the angle at the circumference subtended by the same arc.
- **Any tangent** is perpendicular to a radius drawn to the point of contact (and the converse).

Summary of circle properties

(proofs may be required)

- **The perpendicular line** from the centre to a chord bisects it (and the converse).
- **Equal chords in equal circles** are equidistant from the centre (and the converse).
- **Angles in the same segment** are equal.
- **An angle in a semi-circle** is a right angle.
- **Opposite angles of a cyclic quadrilateral** are supplementary (and the converse).
- **The exterior angle of a cyclic quadrilateral** equals the interior opposite angle.
- **The angle between a tangent and a chord** through the point of contact equals the angle in the alternate segment.
- **Tangents from an external point** are equal.
- **When circles touch**, the line of centres passes through the point of contact.
- **Any three non-collinear points** lie on a unique circle, whose centre is the point of concurrency of the perpendicular bisectors of the intervals joining the points.
- **If an interval subtends equal angles at two points** on the same side of it, then the end points of the interval and the two points are concyclic.
- **The products of the intercepts of two intersecting chords** are equal.
- **The square of the length of the tangent from an external point** is equal to the product of the intercepts of the secant passing through this point.