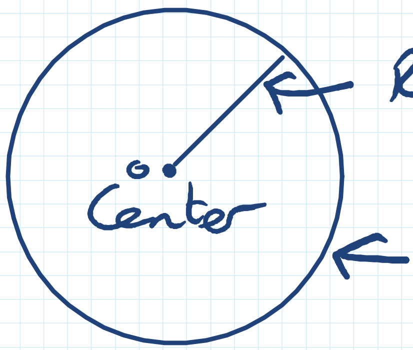
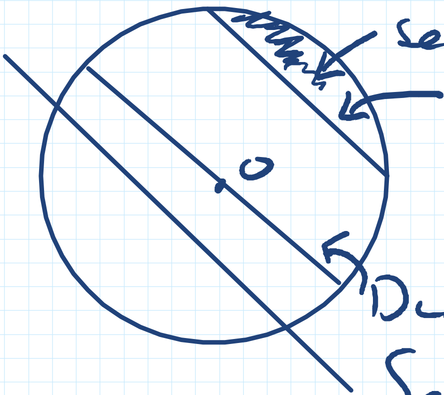
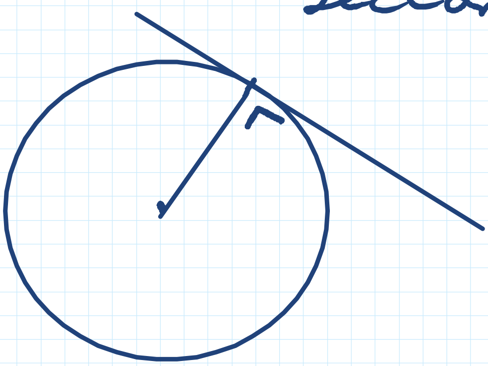
Circles.

The locus of all points which are equidistance to a point called the centre.

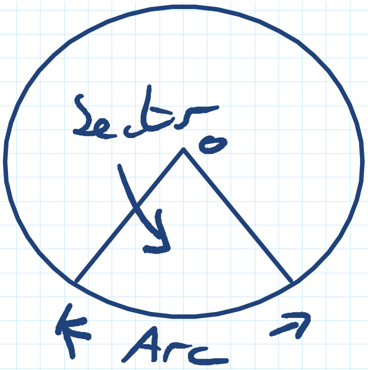
Locus = follow a rule.



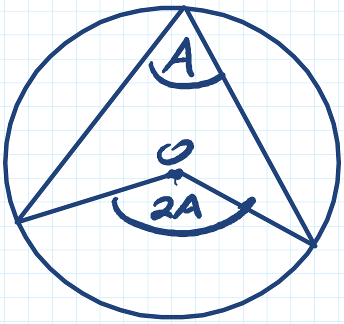




Tangent = line that touches a circle at one point



Info 1

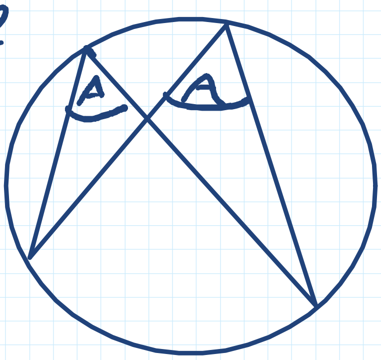


Central angle Theorem. Angle at centre is twice angle at circumference standing on same arc.

Corollary by 3.

All angles standing on same arc are equal

Info 2



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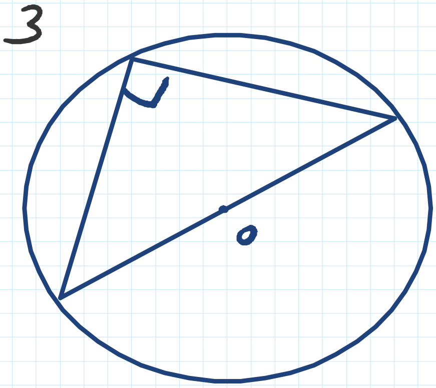
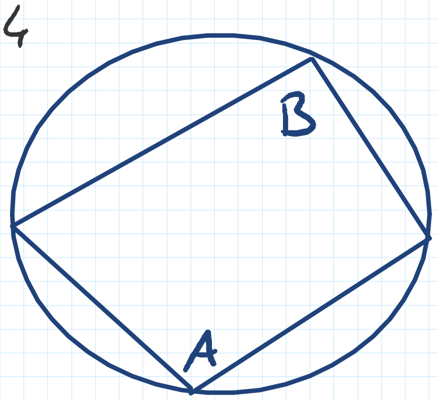


Angle in semi circle is 90°

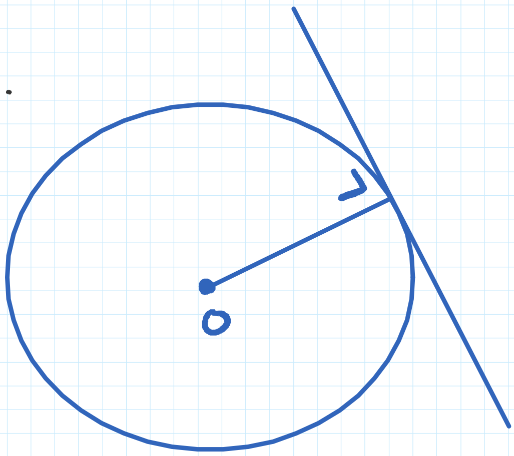
Info 4



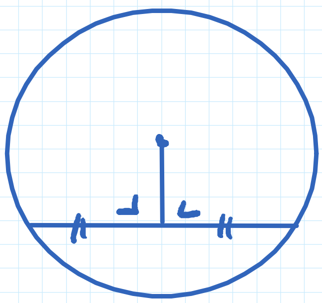
$A + B = 180°$

Opposite angles in cyclic quadrilateral.

Info 5.

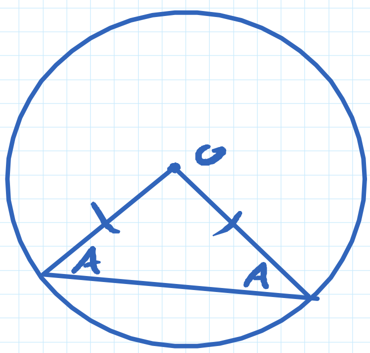


Info 6



A radius (or part of a radius) perpendicular to a chord bisects the chord.

Converse = bisected = $\perp$



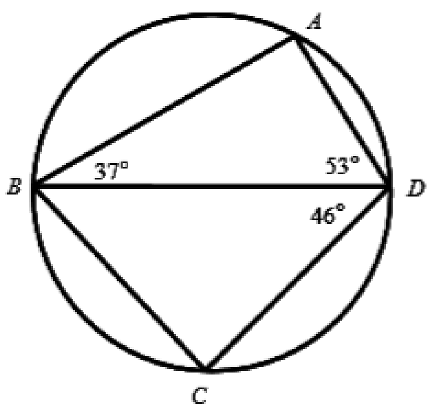
Radii form an isosceles triangle.

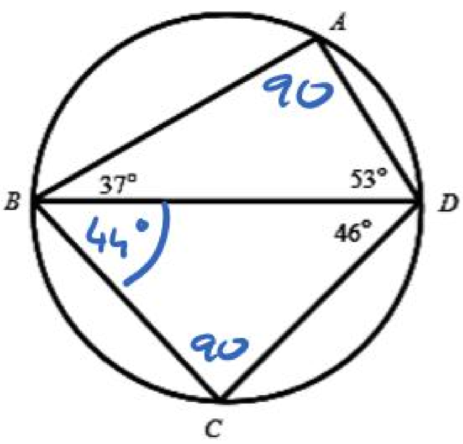
A, B, C and D are points on the circle as shown.

$|\angle ABD| = 37°$ and $|\angle ADB| = 53°$.

(i) ✍ Explain why $[BD]$ is a diameter of the circle.

(ii) ✍ Given that $|\angle BDC| = 46°$, find $|\angle CBD|$.





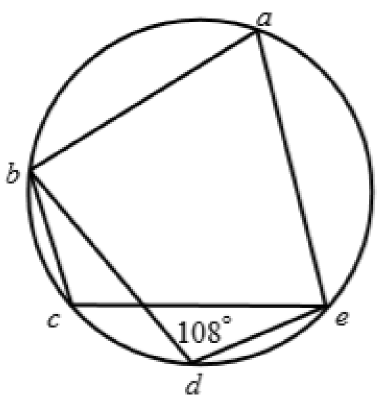
Angle in same circle is 90°

a, b, c, d and e are points on a circle and $|\angle bde| = 108°$.

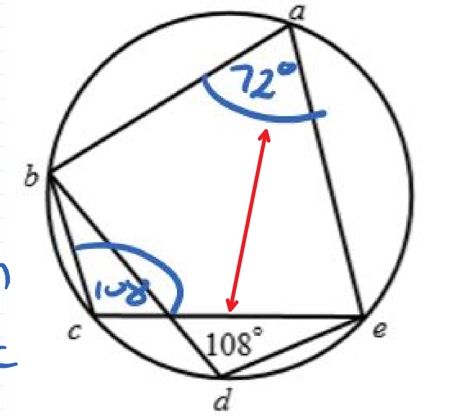
Find **(i)** ✍ $|\angle bae|$,

(ii) ✍ $|\angle bce|$,

giving a reason for your answer in each case.



Angles on same arc

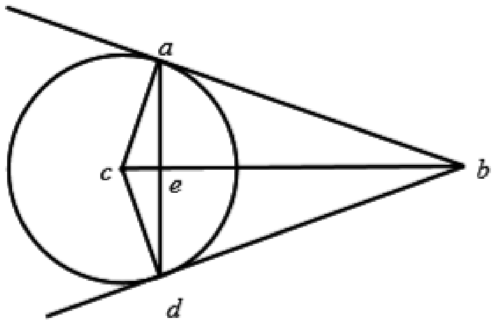


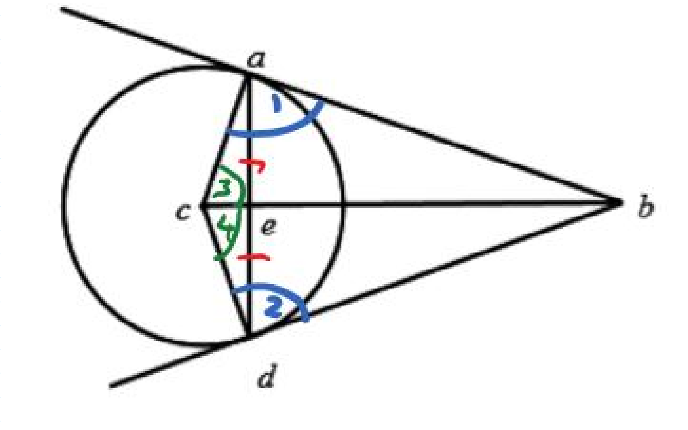
Opposite angles sum to 180°

ba and *bd* are tangents to the circle of centre *c*.
[*bc*] intersects the chord [*ad*] at the point *e*.

(i) Prove that $\Delta\, abc$ is congruent to $\Delta\, dbc$.

(ii) Hence, prove that [*bc*] bisects the chord [*ad*].





$|\angle 1| = |\angle 2| = 90°$

$|bc| = |bc| =$ hyp

$|ac| = |cd| =$ radii

R.H.S.

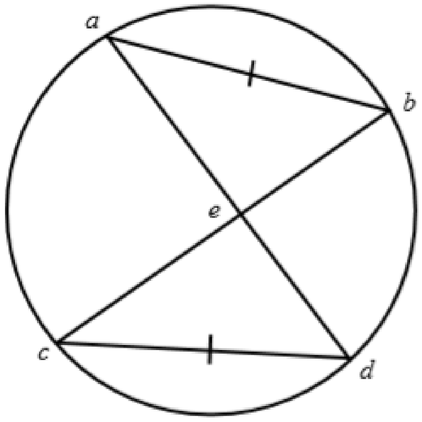
Δace and Δaed

$|ac| = |cd| =$ radii

$|ce| = |ce|$

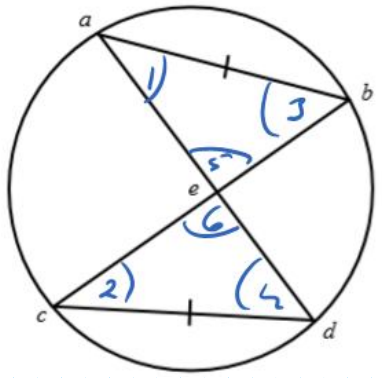
$|\angle 3| = |\angle 4|$

Congruent SAS



$|ab| = |cd|$.

Prove $|ad| = |bc|$.



$|\angle 1| = |\angle 2|$

$|\angle 3| = |\angle 4|$

$|ab| = |cd|$

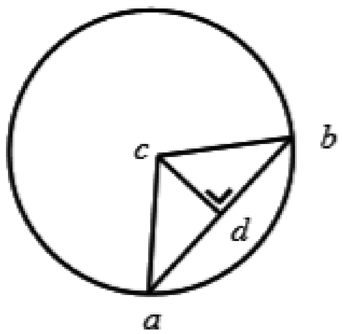
ASA

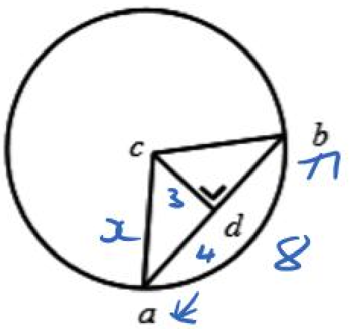
A circle, centre c, has a chord $[ab]$ of length 8.

d is a point on $[ab]$ and cd is perpendicular to ab.

$|cd| = 3$.

✍ Find the length of a diameter of the circle.





$x^2 = 3^2 + 4^2$

$x = 5$ Diameter 10