Circle theorems

Video 1

Angles in same segment are equal

Theorems

30° Find angle x and y

y

x

Angle in same segment: $x = 30^o$ and $y = 30^o$

$= $

Angle at centre is twice angle at circumference

x

$2x$

x

50°

Find angle x

Angle at centre twice angle at circumference: $x = 100^o$
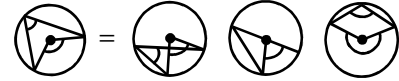
Angles in semicircles are right angles

x

10°

Find angle x

Angle in semicircle is 80°: $x + 10 + 90 = 180 \Rightarrow x = 80^o$

Radii meet tangents at 90°

x

The radius and tangent make angle x.
Find x.

Radius meets tangent at 90°: $x = 90^o$

Perpendicular bisector to chord meets center

x

Line from center bisects chord to make angle x.
Find x.

Perpendicular bisector to chord meets center: $x = 90^o$

Tangents to a point have equal lengths

A B

C

AB and AC are tangents. Angle $CAB = 40^o$.
Find angle ABC.

AB and AC equal so ABC isosceles. $ABC = \frac{180-40}{2} = 70^o$

Alternate segment theorem

60° Find angle x

x

Alternate segment theorem: $x = 60^o$

Opposite angles in cyclic quads
$180 - x$ add to 180

x

x

80°

Find angle x

Opposite angles in cyclic quadrilateral add to 180°:
$x = 180 - 80 = 100^o$

Combo

O B

C

OC is a radius of the circle. Angle $CAB = 35^o$.
Find angle OCB.

A

35

O

70

B

35

C

Angle at center is twice angle at circumference: $COB = 70^o$.
Triangle COB is isosceles: $OCB = 35^o$.

▶ Videos: sickschool.com/c1