

Math 9

8.2

Properties of Chords in a Circle

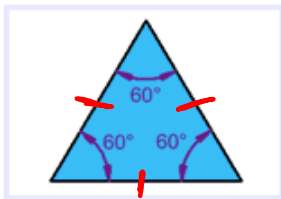
May 27, 2012
Dec. 11, 2018
May 23, 2014

May 14, 2019
Mini Lesson #1:
TASK 1, 2 and 3

May 22, 2015

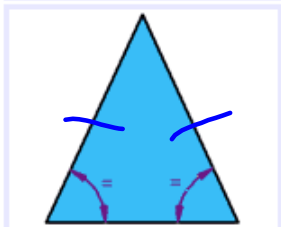
Apr 17-8:11 PM

Recall: Types of triangles!



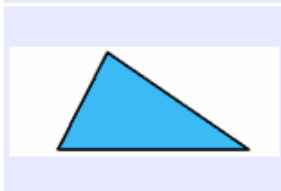
Equilateral Triangle

Three equal sides
Three equal angles, always 60°



Isosceles Triangle

Two equal sides
Two equal angles



Scalene Triangle

No equal sides
No equal angles

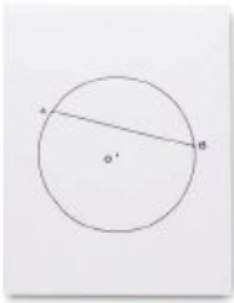
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Each of you will need a circle, a pair of scissors, a colored pencil and a ruler

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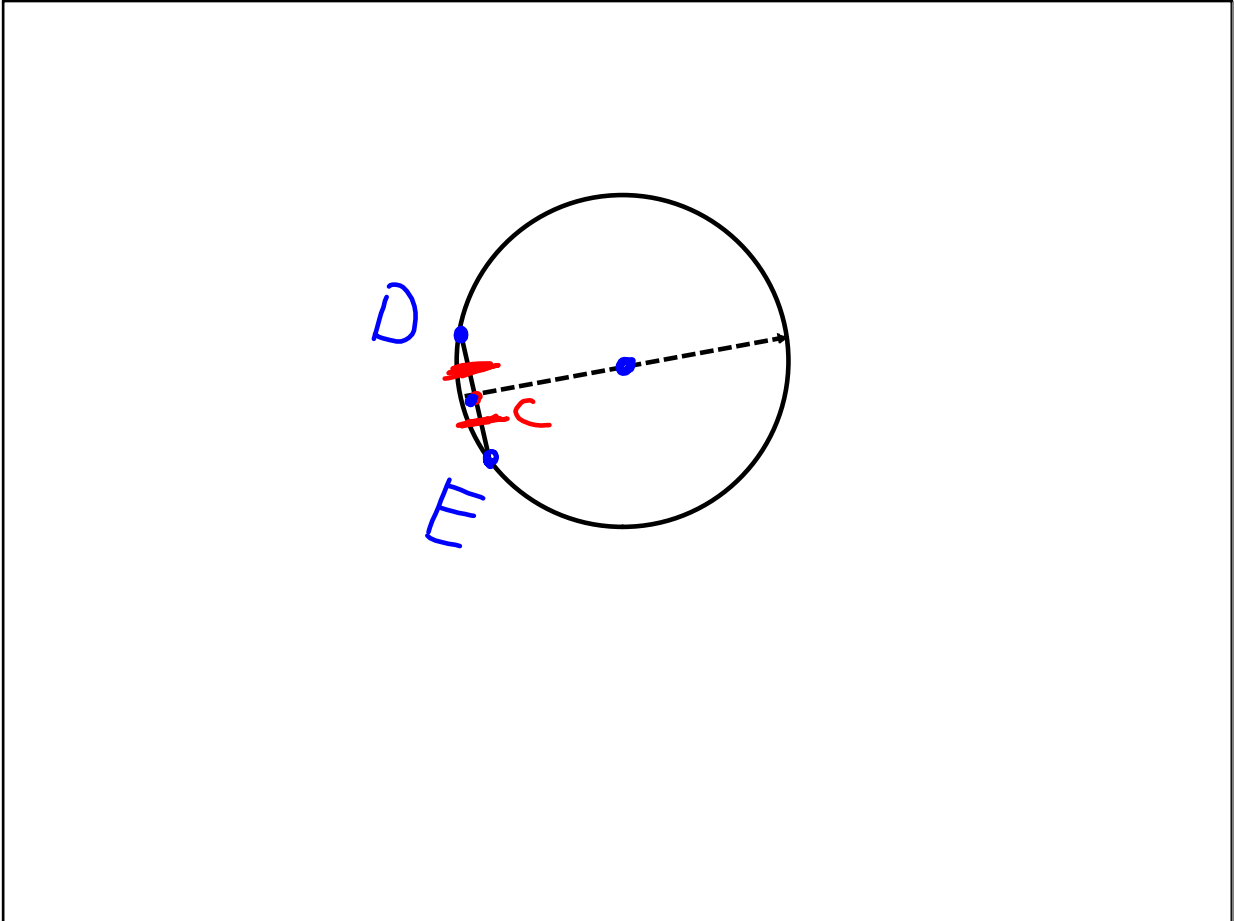
Investigate

2



- ▶ Choose two points A and B on the circle. Join these points to form line segment AB. Make sure AB does *not* go through the centre of the circle.
- ▶ Fold the circle so that A coincides with B. Crease the fold, open the circle, and draw a line along the fold. **Mark the point C where the fold line intersects AB.** What do you notice about the angles at C? What do you notice about line segments AC and CB?
- ▶ Repeat the steps above for two other points D and E on the circle.

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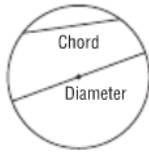
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Connect

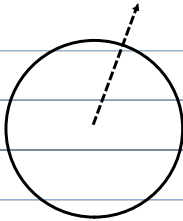
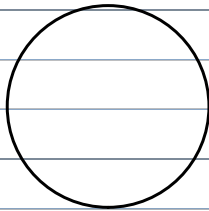
A line segment that joins two points on a circle is a **chord**.

A diameter of a circle is a chord through the centre of the circle.

The chord, its perpendicular bisector, and the centre of the circle are related.



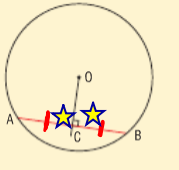
A perpendicular bisector intersects a line segment at 90° and divides the line segment into two equal parts.

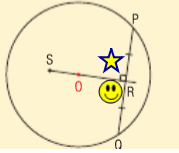
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We use 3 properties to solve problems involving chords in a circle:

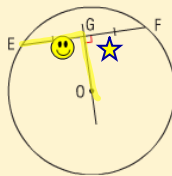
Perpendicular to Chord Property 1
 The perpendicular from the centre of a circle to a chord bisects the chord; that is, the perpendicular divides the chord into two equal parts.
 Point O is the centre of the circle.
 When $\angle OCB = \angle OCA = 90^\circ$, then $AC = CB$



Perpendicular to Chord Property 2
 The perpendicular bisector of a chord in a circle passes through the centre of the circle.
 When $\angle SRP = \angle SRO = 90^\circ$ and $PR = RQ$, then SR passes through O, the centre of the circle.



Perpendicular to Chord Property 3
 A line that joins the centre of a circle and the midpoint of a chord is perpendicular to the chord.
 When O is the centre of a circle and $EG = GF$, then $\angle OGE = \angle OGF = 90^\circ$



$\angle PRS$ ★

$\angle QRS$ 😊

$\angle OGF$

$\angle G = 90^\circ$

$\angle OGE = 90^\circ$

$\angle FGO = 90^\circ$

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Example 1 Determining the Measure of Angles in a Triangle

Point O is the centre of a circle, and line segment OC bisects chord AB. $\angle OAC = 33^\circ$. Determine the values of x° and y° .

$90 + 33 = 123^\circ$
 $180 - 123 = 57^\circ = y^\circ$

$x = 33^\circ$

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a)

b)

c)

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Practice 1:

Point O is the centre of the circle. Determine the values of x° and y° .

$x = 90^\circ$
 Chord property

$EC = CD$

$180 - 90 = 90$
 $90 - 48 = 42$
 $y^\circ = 42^\circ$ (Sum of triangle)

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