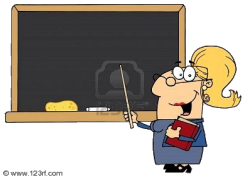
Warm Up
May 12, 2017

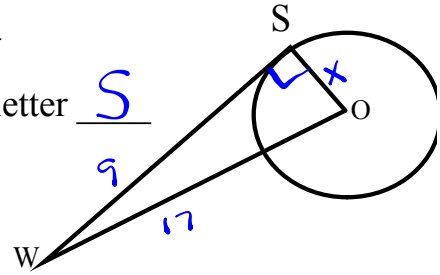


Fill in the blanks (SW is a tangent line)

1) The center is labelled with the letter O

2) The point of tangency is labelled with the letter S

3) The radius is the line OS



SHOW YOUR WORK

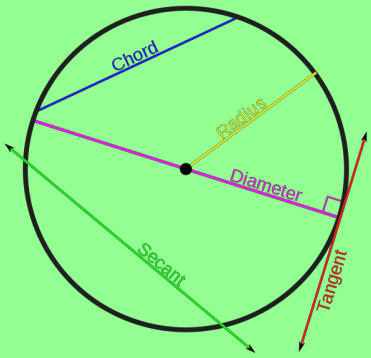
4) Find the length of the radius if OW = 17 and SW = 9

$a^2 = c^2 - b^2$
$x^2 = 17^2 - 9^2$
$= 289 - 81$
$= 208$
$x = \sqrt{208}$
$= 14.42$

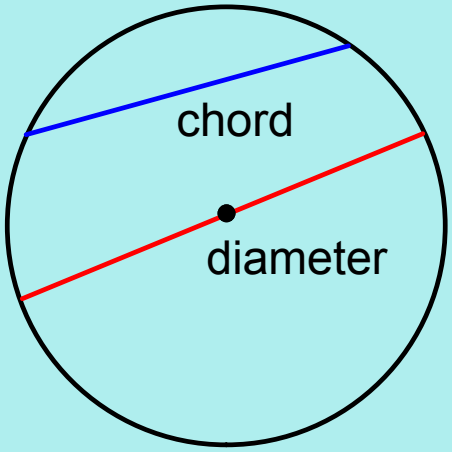
The radius is 14.42

Section 8.2

Properties of Chords in Circles

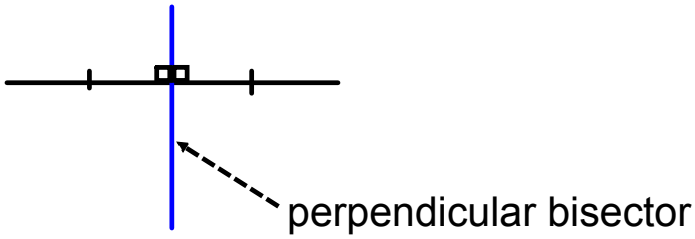


- A line segment that joins two points on a circle is a **chord**.



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

Perpendicular bisector - intersects a line segment at 90^0 and divides the line segment into two equal parts.

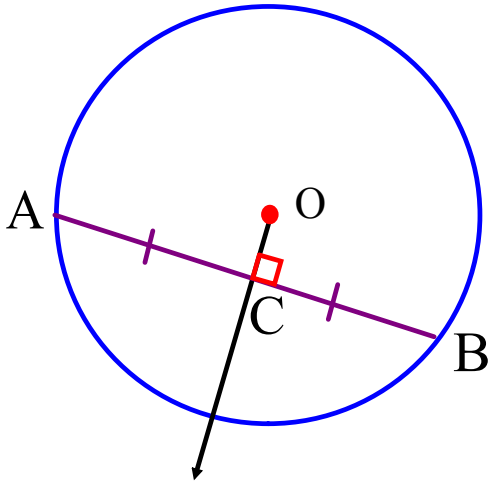


Perpendicular to a Chord Property 1

- A line drawn from the centre of a circle that is perpendicular to a chord bisects the chord. (It cuts the chord into two equal parts.)

$\angle OCA = \angle OCB = 90^o$

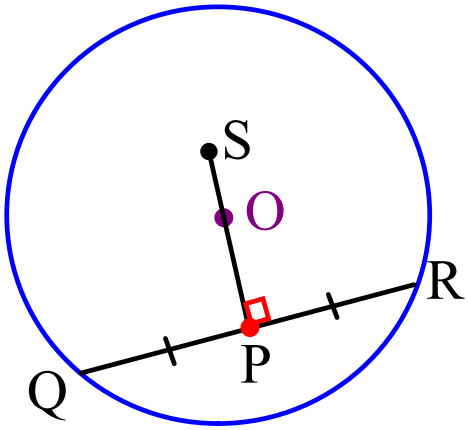
$AC = CB$



Perpendicular to a Chord Property 2

- The perpendicular bisector of a chord in a circle passes through the centre of the circle.

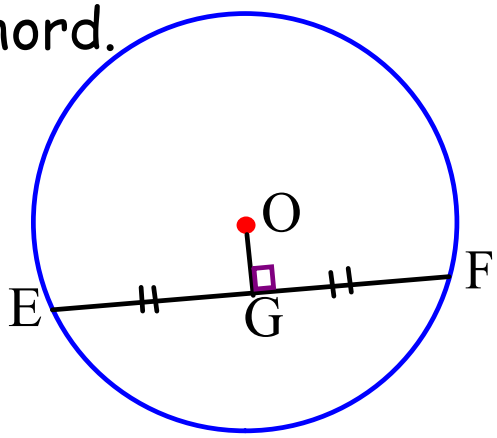
When $\angle SPR = \angle SPQ = 90^0$ and $RP = PQ$, then SP passes through the centre.



Perpendicular to a 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 and EG = GF, then
$\angle OGE = \angle OGF = 90^0$.

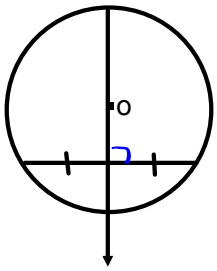


3 facts

- It goes through the center
- It bisects the chord (meets in the middle)
- It meets the chord at 90^0

If you have two of the facts you automatically have the third one

√ √ then √



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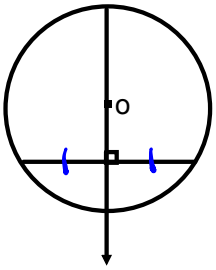

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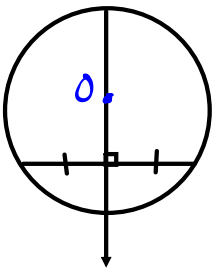


3 facts

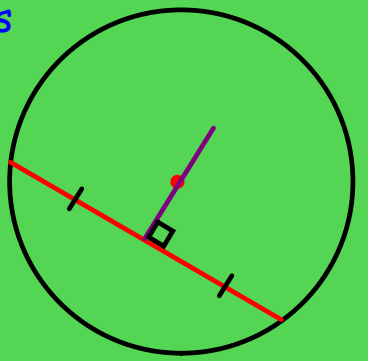
- It goes through the center
- It bisects the chord (meets in the middle)
- It meets the chord at 90^0

STOP!

Aren't they all saying the same thing?

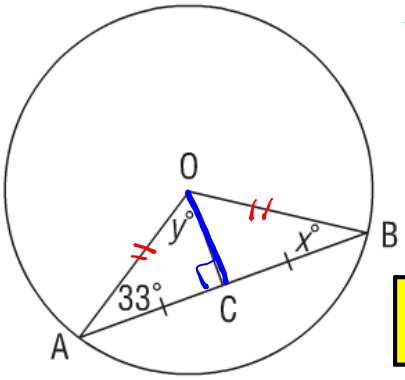
Yes!

When we see diagrams like this, we know that the lines are perpendicular, and the chord is cut in two equal pieces.



Determining the Measure of Angles in a Triangle

Example #1. Determine the values of x^o and y^o.



Think: What do I know about angle ACO?

The angles formed at C are 90°.

Use angle sum of a triangle:

$y = 180 - 90 - 33$

Therefore, y^o = 57

Isosceles
- two equal sides

To find angle x:

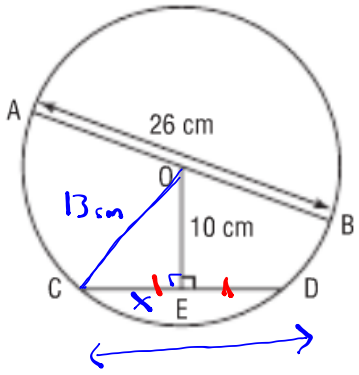
We know the radii are equal, so ΔAOB is isosceles.

Then, $\angle OBA = \angle OAB$

Therefore, x^o = 33°

Using the Pythagorean Theorem in a Circle

Example #2. What is the length of chord CD, to the nearest tenth?



Step 1) Draw in a radius that would make a right angle triangle

Step 2) Use Pythagorean Theorem to calculate CE (or ED) (missing leg: $a^2 = c^2 - b^2$)

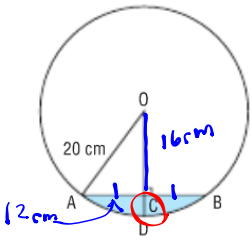
$a^2 = c^2 - b^2$
$= 13^2 - 10^2$
$= 169 - 100$
$= 69$
$a = \sqrt{69}$

$CD = 2\sqrt{69}$
$= 16.6$ cm

Step 3)

Solving Problems Using the Property of a Chord and its Perpendicular

Example #3. Determine the length of CD.



AB = 24 cm

Step 1) Find length of AC first

Step 2) Find the length of OC by Pythagorean Theorem

$a^2 = c^2 - b^2$

$a^2 = c^2 - b^2$
$= 20^2 - 12^2$
$= 400 - 144$
$= 256$
$a = \sqrt{256}$
$= 16$

CD = 20 - 16
= 4cm

Step 3) OD is a radius as well

OD = OA = 20cm

Step 4)

Homework:

p. 397 - 398

omit 8, 9