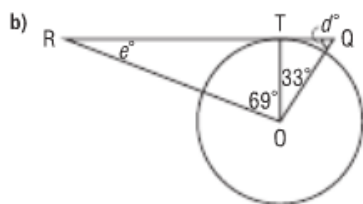
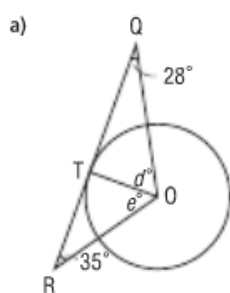
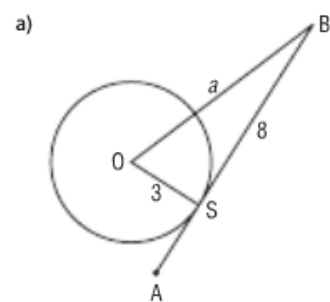


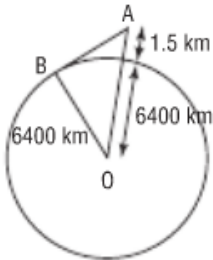
7. Point T is a point of tangency and O is the centre of each circle. Determine each value of d° and e° .



8. Point S is a point of tangency and O is the centre of each circle. Determine each value of a to the nearest tenth.

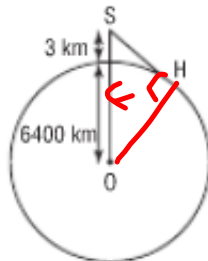


12. A small aircraft, A, is cruising at an altitude of 1.5 km. The radius of Earth is approximately 6400 km. How far is the plane from the horizon at B? Calculate this distance to the nearest kilometre.



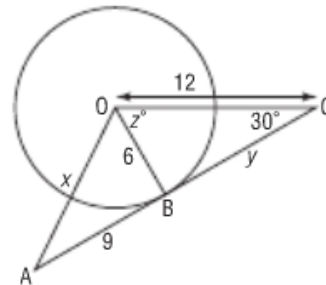
139 km

13. A skydiver, S, jumps from a plane at an altitude of 3 km. The radius of Earth is approximately 6400 km. How far is the horizon, H, from the skydiver when she leaves the plane? Calculate this distance to the nearest kilometre.



196 KM

14. Point C is the centre of the circle. Point B is a point of tangency. Determine the values of x , y , and z° . Give the answers to the nearest tenth where necessary. Justify the strategies you used.

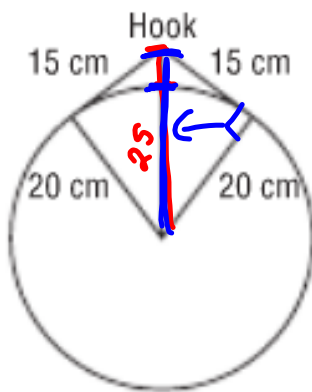


$x = 10.8$

$y = 10.4$

/

17. A circular mirror with radius 20 cm hangs by a wire from a hook. The wire is 30 cm long and is a tangent to the mirror in two places. How far above the top of the mirror is the hook? How do you know?



The hook is 5 cm above the mirror

radius
 $25 - 20 = 5 \text{ cm}$

$$c^2 = a^2 + b^2$$

$$c^2 = 20^2 + 15^2$$

$$c^2 = 400 + 225$$

$$\sqrt{c^2} = \sqrt{625}$$

$$c = 25$$

Warm-Up

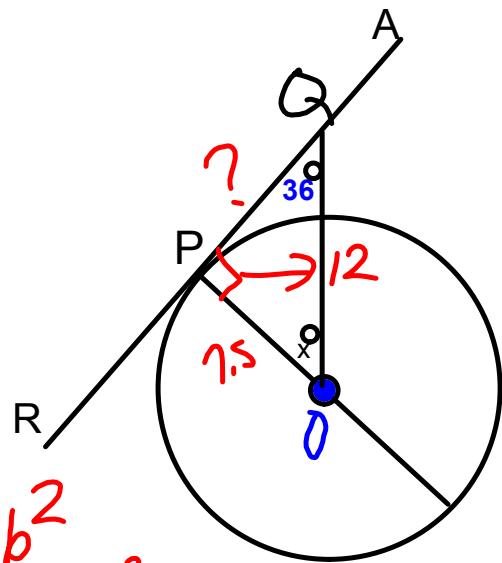
*The radius of the circle is ~~15~~ ^{7.5} cm

*What is the tangent? RA, AR

*What is the point of tangency? P

* Find x° $POA = 54^\circ$

*Given the ~~w~~ hypotenuse is 12. Find the unknown side



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

(side)
 hypotenuse

$c^2 = a^2 + b^2$
 $12^2 = a^2 + 7.5^2$
 $144 = a^2 + 56.25$
 $a^2 = 87.75$
 $a = 9.4$

SECTION 8.2
PROPERTIES OF A CHORD

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

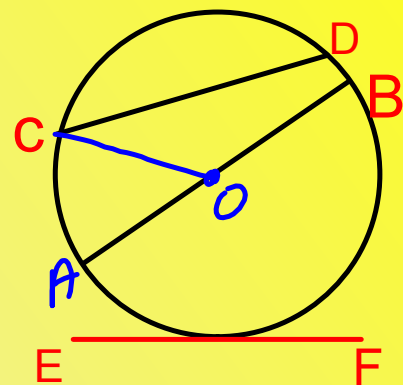
A diameter of the circle is a chord that goes through the center of the circle.

1. Name the tangent. EF

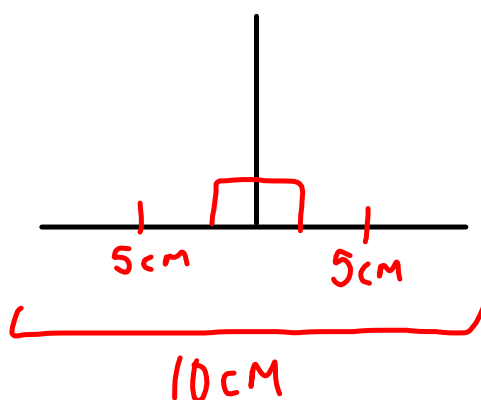
2. Name the chord[s].
 AB, BA, CD, DC

3. Name the diameter
 AB

4. Is the line from O to C a chord?
No its a radius



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



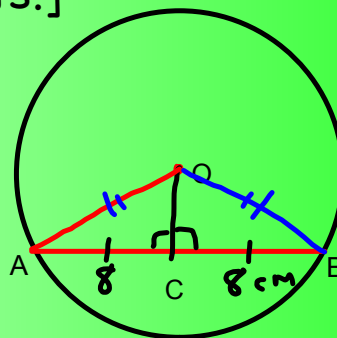
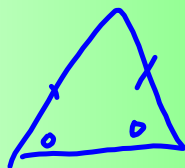
Properties of a CHORD

1. Perpendicular to chord Property 1

The perpendicular from the center of a circle to a chord bisects the chord [that is the perpendicular divides the chord into two equal parts.]

$$AC = CB$$

$$\angle ACO = \angle BCO$$



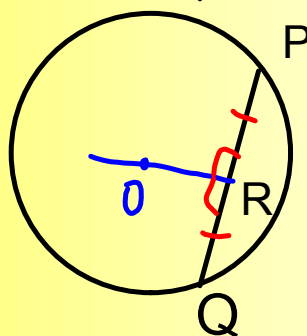
$$AB = 16$$

$$AC = 8$$

2. Perpendicular to Chord Property 2

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

When $PR = QR$ and $\angle SRP = \angle SRQ$ then SR passes through O [the center of the circle]

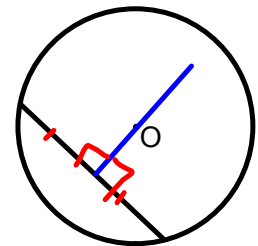


S

To Summarize

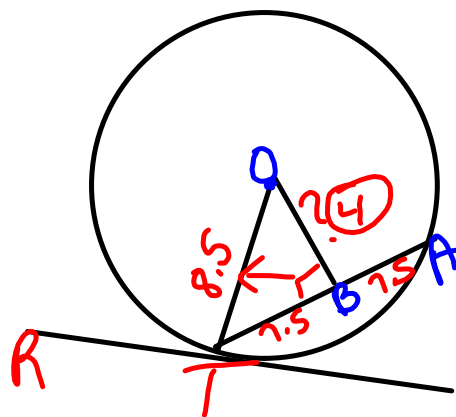
A perpendicular bisector of a chord:

- * Hits the chord at a 90° angle
- * Cuts the chord into two equal parts
- * Passes through the center



Draw a circle that includes the following information:

1. A tangent [RT] where T is the point of tangency
2. Label the center O
3. A radius [OT]
4. A cord [TA]
5. Perpendicular line from O to the chord [point B]
6. If the ~~diameter~~ ^{radius} of the circle is ~~17~~ ^{8.5} and the chord length is ~~15~~ ^{7.5 each side} what is the distance from the center of the circle to the chord?

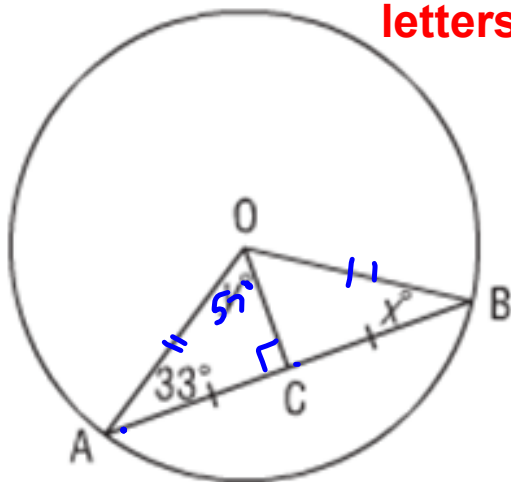


$$\begin{aligned}
 c^2 &= a^2 + b^2 \\
 8.5^2 &= a^2 + 7.5^2 \\
 72.25 &= a^2 + 56.25 \\
 a^2 &= 16 \\
 a &= 4
 \end{aligned}$$

Let's apply these properties of a chord...

Find the value of y and x

An angle has to be named using 3 letters!!!

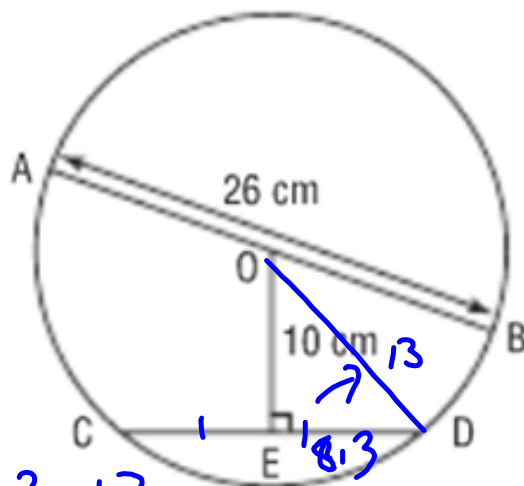


$$\angle AOC = 57^\circ$$

$$\angle OBC = 33^\circ$$

Find the length
of CD.

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



$$c^2 = a^2 + b^2$$

$$13^2 = 10^2 + b^2$$

$$169 = 100 + b^2$$

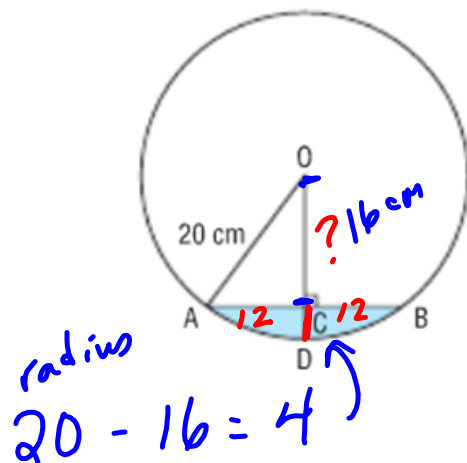
$$b^2 = 69$$

$$b = 8.3$$

$$CD = 16.6$$

The radius of the pipe below is 20 cm. Water fills less than one-half of the pipe. The surface of the water AB is 24 cm wide.

Determine the maximum depth of the water, which is the depth CD.



$$c^2 = a^2 + b^2$$

$$20^2 = a^2 + 12^2$$

$$400 = a^2 + 144$$

$$\sqrt{a^2} = \sqrt{256}$$

$$a = 16$$

Homework



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3, 4, 5, 6, 7, 11, 14

*Name an angle
with 3 letters*

