

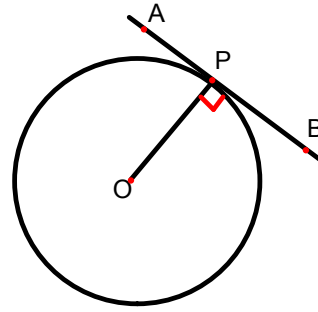
## Sec 8.1 Properties of Tangents to a Circle

### Section 8.1 Properties of Tangents to a Circle

#### Tangent-Radius Property

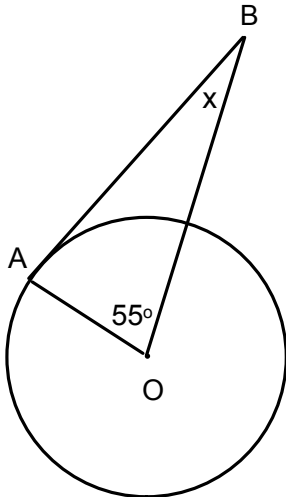
A tangent to a circle is perpendicular to the radius at the point of tangency.

$$\angle APO = \angle BPO = 90^\circ$$



#### Example 1

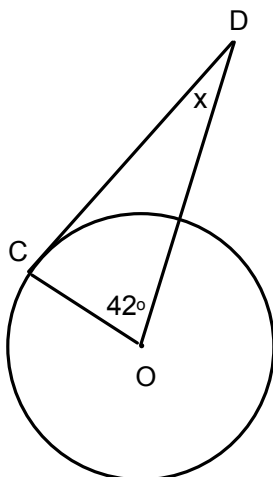
Point O is the center of a circle and AB is tangent to the circle. In  $\triangle OAB$ ,  $\angle AOB = 55^\circ$ . Determine the measure of  $\angle OBA$ .



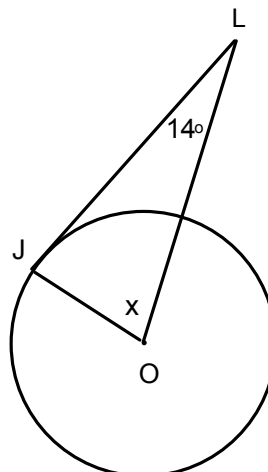
#### Your Turn

Find the missing angle, x, in each diagram.

a)



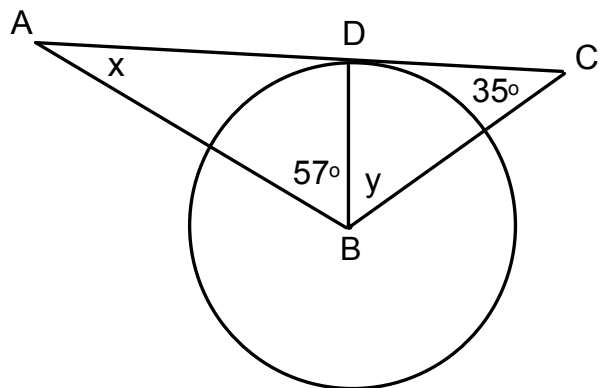
b)



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### Example 2

Find the missing angles,  $x$  and  $y$ , in the diagram.  $B$  is the center of the circle.



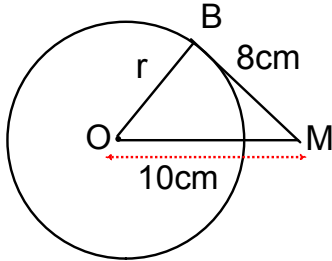
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### Using the Pythagorean Theorem in a Circle

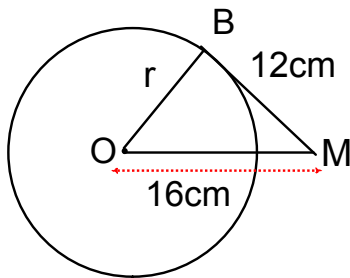
↳ Remember that Pythagorean Theorem can be used to find a missing side in a right triangle:  $a^2 + b^2 = c^2$

**Example 3** Find the length of the radius,  $r$ .

Where is the right angle?



**Your Turn** Find the length of the radius,  $r$ .



### Example 4

An airplane is cruising at an altitude of 9000m. A cross section of the earth is a circle with a radius approximately 6400km. A passenger wonders how far she is from a point H on the horizon she sees outside the window. Calculate the distance to the nearest kilometer.

