Monday, April 27, 2020

Sec 12-1: Tangent Lines

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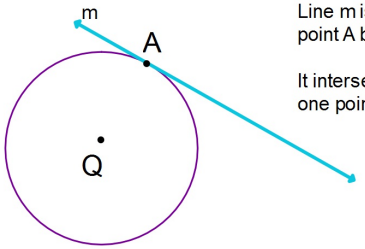
A line is tangent to a circle if they are in the same plane and the line intersects the circle in exactly one point.

Remember, a line goes forever in both directions.

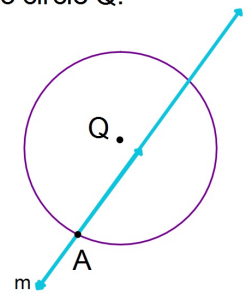
A line tangent to circle Q is shown below.



Line m is tangent to circle Q at point A because

It intersects circle Q at that one point only.

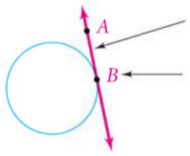
Below is an example of a line that is NOT tangent to circle Q.



Line m is NOT tangent to circle Q at point A because

lines extend forever in both directions and line m would intersect circle Q a second time.

From our book:



A **tangent to a circle** is a line in the plane of the circle that intersects the circle in exactly one point.

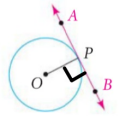
The point where a circle and a tangent intersect is the **point of tangency.**

$\overrightarrow{BA}$ is a tangent ray and $\overline{BA}$ is a tangent segment.

Theorem 12-1

If a line is tangent to a circle, then the line is perpendicular to the radius drawn to the point of tangency.

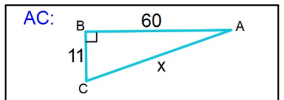
$\overleftrightarrow{AB} \perp \overline{OP}$



This means that whenever you draw a radius to a point of tangency you get a right angle.

$\overline{AB}$ is tangent to circle C at point B.

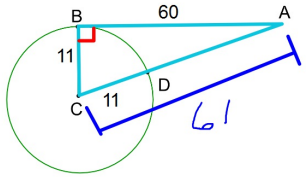
If AB = 60 and the radius of the circle is 11. Find AC and AD.



$x^2 = 11^2 + 60^2$

$x = \sqrt{11^2 + 60^2} = 61$

AC = 61

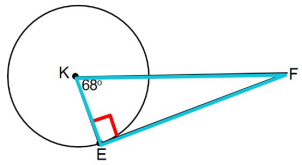


AD:

AD = AC - CD = 61 - 11

AD = 50

$\overline{EF}$ is tangent to Circle K at pt E. Find the measure of ∠EFK.



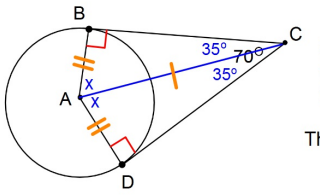
∠KEF must be a right angle.

Using ΔEFK:

∠EFK = 180° - 90° - 68°

∠EFK = 22°

Both lines are tangent to the circle. Find the measure of Central Angle ∠BAD.



The two Δ's are ≅ by HL.

Since corresponding parts are equal in ≅Δ's the two angles at pt C are ≅, 35°each.

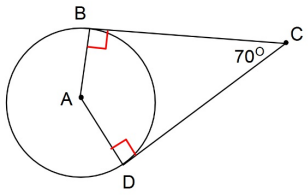
The third angle in each Δ (x) is ≅ as well.

$x = 180° - 90° - 35° = 55°$

$\angle BAD = 2x = 2(55°) = 110°$

$\angle BAD = 110°$

A second way to answer this question follows:



∠ABD and ∠ADC are 90°

ABCD is a Quadrilateral so the sum of the interior angles is 360°

$\angle BAD = 360° - 90° - 90° - 70°$

$\angle BAD = 110°$

You can now do the first few problems of Practice #21.

We'll finish the rest of the material for Practice #21 tomorrow.

This practice will be due by 10:00 pm on Thursday, April 30.