Lesson 10.5 and 10.6 Tangents and Secants

Monday, May 08, 2023 8:35 PM

Click Link Below for Interactive Pear Deck Powerpoint
https://app.peardeck.com/student/tsedfxfrs

Lesson 10.5 and

Lesson 10.5/10.6 Tangents and Secants
Workbook pages 227-242

Content Objective

Students solve problems using relationships between circles, tangents, and secants.

Florida's B.E.S.T. Standards for Mathematics

MA.912.GR.5.3

Construct the inscribed and circumscribed circles of a triangle.

MA.912.GR.6.1

Solve mathematical and real-world problems involving the length of a secant, tangent, segment or chord in a given circle.

MA.912.GR.6.2

Solve mathematical and real-world problems involving the measures of arcs and related angles.

Learn

Tangents

A **tangent to a circle** is a line or segment in the plane of a circle that intersects the circle in exactly one point and does not contain any points in the interior of the circle. For a line that intersects a circle in one point, the **point of tangency** is the point at which they intersect.

McGraw Hill | Tangents

This material may be reproduced for licensed classroomuse only and may not be further reproduced or distributed.

Learn

Theorem 10.11

In a plane, a line is tangent to a circle if and only if it is perpendicular to a radius drawn to the point of tangency.

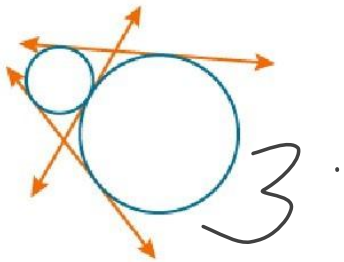
Theorem 10.12: Tangent to a Circle Theorem

If two segments from the same exterior point are tangent to a circle, then they are congruent.

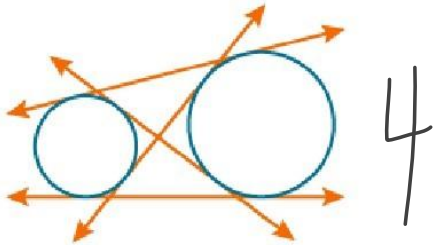
Example 1
Identify Common Tangents

Identify the number of common tangents that exist between each pair of circles. If no common tangent exists, state *no common tangent*.

a.

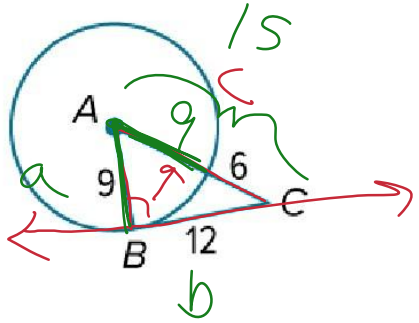


b.



Example 2
Identify a Tangent

$\overline{AB}$ is a radius of $\odot A$. Determine whether $\overline{BC}$ is tangent to $\odot A$. Justify your answer.



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

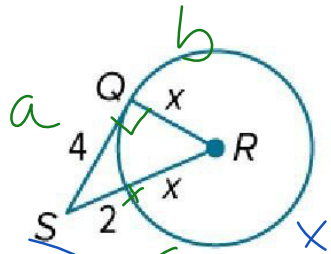
$15^2 = 9^2 + 12^2$

$225 = 81 + 144$

$225 = 225$ ✓

Example 3
Use a Tangent to Find Missing Values

$\overline{QS}$ is tangent to $\odot R$ at Q. Find the value of x.

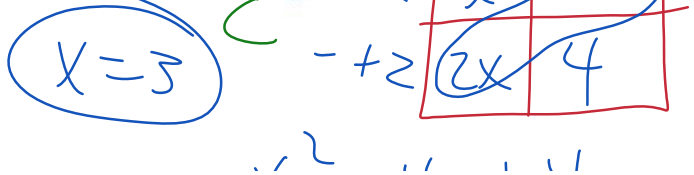


First
Outside
Inside
Last

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

$(x+2)^2 = 4^2 + x^2$

$(x+2)(x+2) = 16 + x^2$



$x = 3$

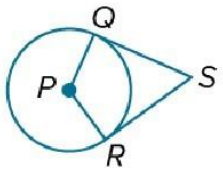
Students, draw anywhere on this slide!

Pear Deck Interactive Slide
Do not remove this bar

Learn
Circumscribed Angles

A **circumscribed angle** is an angle with sides that are tangent to a circle.

Theorem 10.13

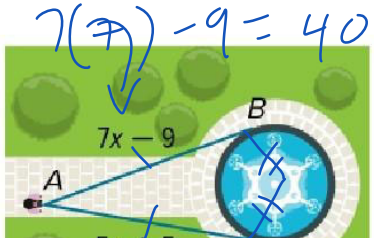
Words	If two segments or lines are tangent to a circle, then the circumscribed angle and the central angle that intercept the arc formed by the points of tangency are supplementary.	
Example	If $\overline{QS}$ and $\overline{RS}$ are tangent to $\odot P$, then $m\angle P + m\angle S = 180°$.	

Students, draw anywhere on this slide!

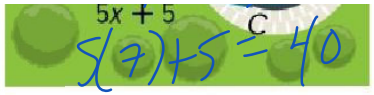
Pear Deck Interactive Slide
Do not remove this bar

Example 4
Use Congruent Tangents to Find Measures

PHOTOGRAPHY A photographer wants to take a picture of a local fountain. She positions herself at point *A* so that the fountain will be centered in the picture.



$\overline{AB}$ and $\overline{AC}$ are tangent to the fountain as shown. If the lengths of the tangents are given in feet, find *AB*.



$5(7)+5=40$

$7x-9=5x+5$

$+9 \quad +9$

$7x=5x+14$

$-5x \quad -5x$

$2x=14$

$x=7$

Students, draw anywhere on this slide!

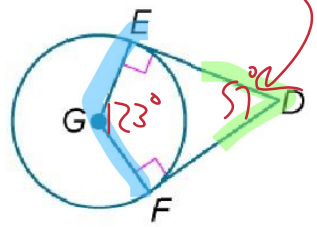
Pear Deck Interactive Slide
Do not remove this bar

Example 5

Use Circumscribed Angles to Find Measures

$19(6)+9=123$

If $m\angle EGF = (19x + 9)°$ and $m\angle D = (10x - 3)°$, find $m\angle D$.



$19x+9+10x-3=180$

$10(6)-3$

$60-3$

$57°$

$29x+6=180$

$-6 \quad -6$

$29x=174$

$\frac{29x}{29}=\frac{174}{29}=6$

$x=6$

Students, draw anywhere on this slide!

Pear Deck Interactive Slide
Do not remove this bar

Example 6

Find Measures in Circumscribed Polygons

$\triangle JKL$ is circumscribed about $\odot Q$. Find the

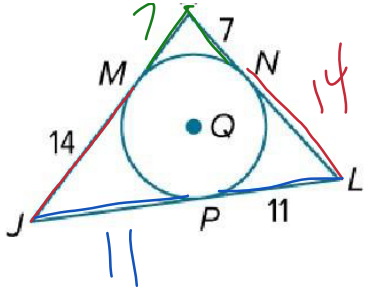
K

perimeter of △*JKL*.

$7(2) + 14(2) + 11(2)$

$14 + 28 + 22$

64



Students, draw anywhere on this slide!

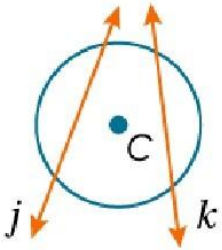
Pear Deck Interactive Slide
Do not remove this bar

Learn

Tangents, Secants, and Angle Measures

A **secant** is any line or ray that intersects a circle in exactly two points. Lines *j* and *k* are secants of ⊙*C*.

When two secants intersect inside a circle, the angles formed are related to the arcs they intercept.



Students, draw anywhere on this slide!

Pear Deck Interactive Slide
Do not remove this bar

Example 1