MAY 11, 2016

UNIT 8: CIRCLE GEOMETRY

8.1: PROPERTIES OF TANGENTS TO A CIRCLE

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MATH 9

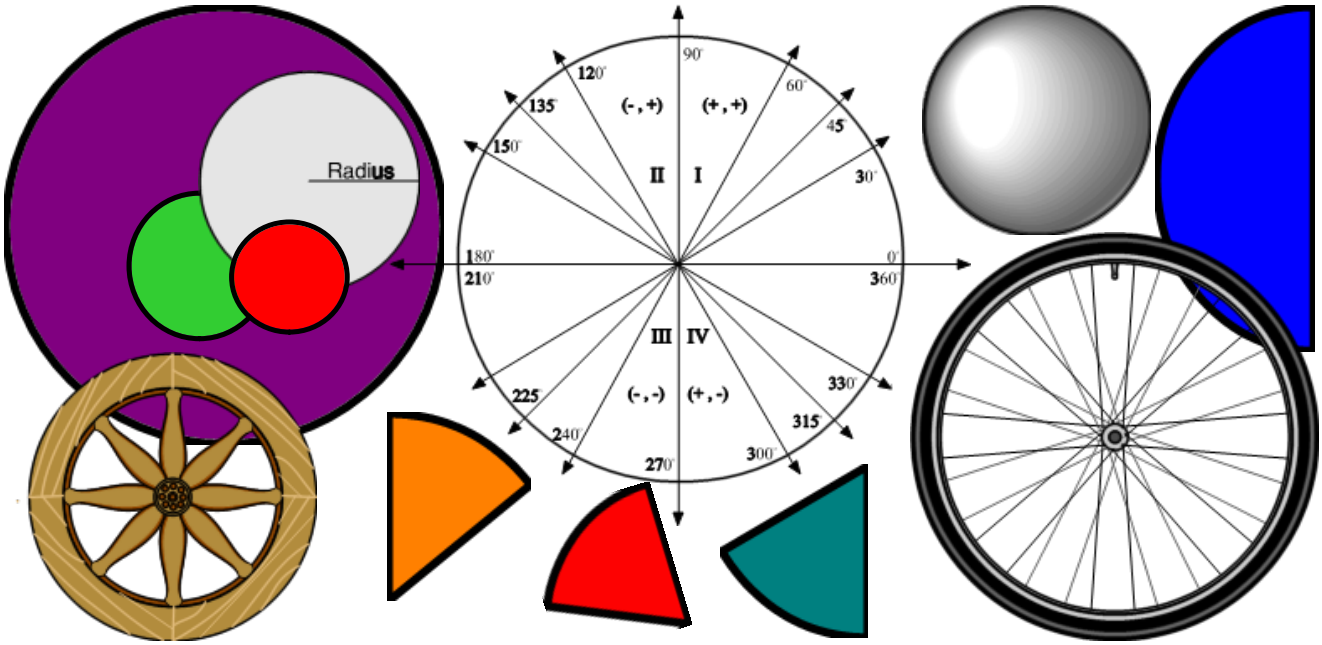
WHAT'S THE POINT OF TODAY'S LESSON?

We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 1" OR "SS1" which states:

"Solve problems and justify the solution strategy using circle properties, including:

* **the perpendicular from the centre of a circle to a chord bisects the chord;**
* **the measure of the central angle is equal to twice the measure of the inscribed angle subtended by the same arc;**
* **the inscribed angles subtended by the same arc are congruent;**
* **a tangent to a circle is perpendicular to the radius at the point of tangency."**

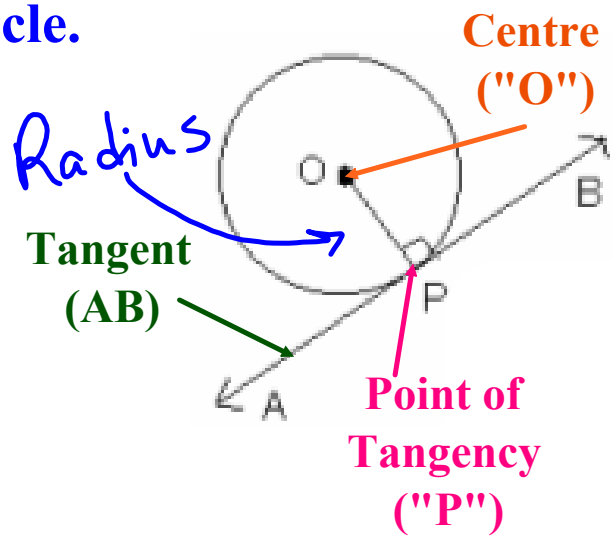
Please turn to page 382 in *MMS9*
("What You'll Learn" and "Why It's Important".



VOCABULARY:

1. **TANGENT: A line that intersects a circle at only one point (outside the circle).**
2. **POINT OF TANGENCY: The point where the tangent intersects the circle.**

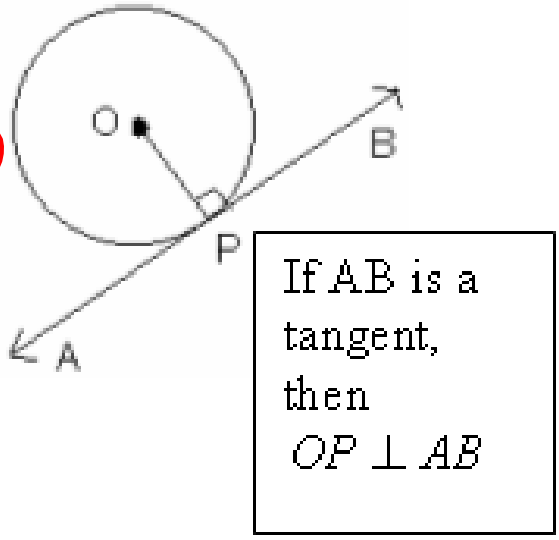
(Please turn to *MMS9*, page 385 for a moment.)

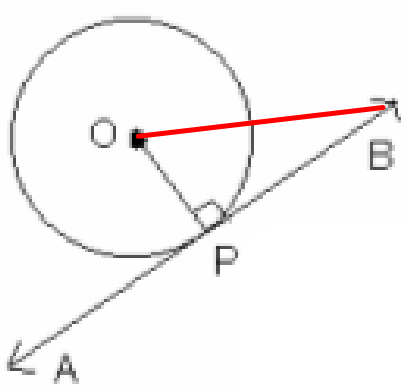


VOCABULARY:

3. TANGENT-RADIUS PROPERTY (TRP): A tangent to a circle is perpendicular to the radius at the point of tangency.

<APO = <BPO = 90° (TRP)





By joining "O" with "B", a right triangle is formed. What theorem could you use to find a missing side length here?

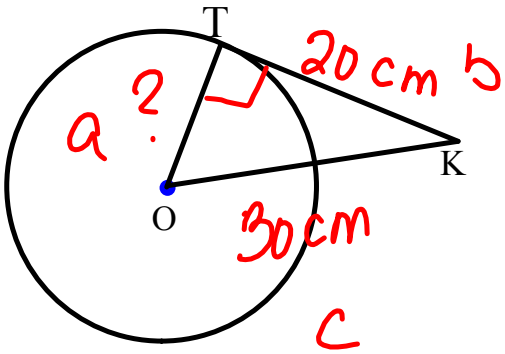
THE PYTHAGOREAN THEOREM!!!

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

Using the Pythagorean Theorem in a Circle

Point O is the centre of a circle, and KT is a tangent to the circle. KT measures 20 cm, and KO measures 30 cm. Determine the length of the radius, OT, to the nearesttenth.

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



$\angle KTO = 90°$ (TRP)

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

$a^2 + 20^2 = 30^2$

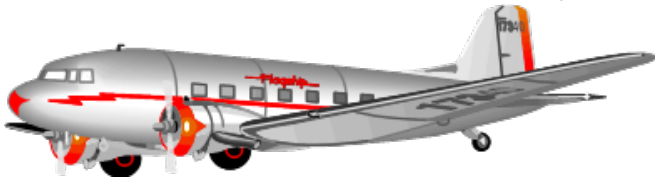
$a^2 + 400 = 900$

$\sqrt{a^2} = \sqrt{500}$

$a \doteq 22.3607$

$a \doteq 22.4\text{cm}$

Solving Problems Using the Tangent and Radius Property



An airplane, W, is cruising at an altitude of 5600 m. A cross section of Earth is a circle with radius approximately 6400 km. A passenger wonders how far she is from a point H on the horizon she sees outside the window. Calculate this distance to the nearest kilometre.

$\angle OHW = 90°$ (TRP)

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

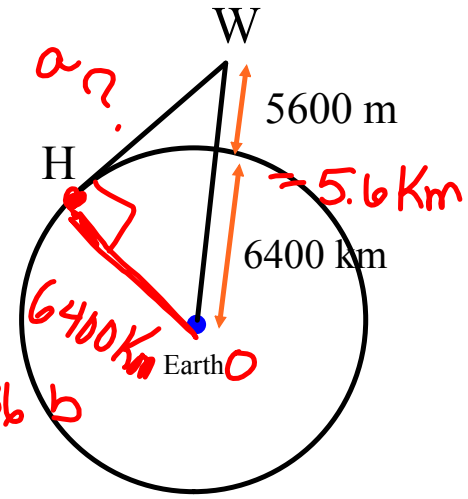
$a^2 + 6400^2 = 6405.6^2$

$a^2 + 40\,960\,000 = 41\,031\,711.36$

$\sqrt{a^2} = \sqrt{71711.36}$

$a \doteq 267.7898$

$a \doteq 268$ Km

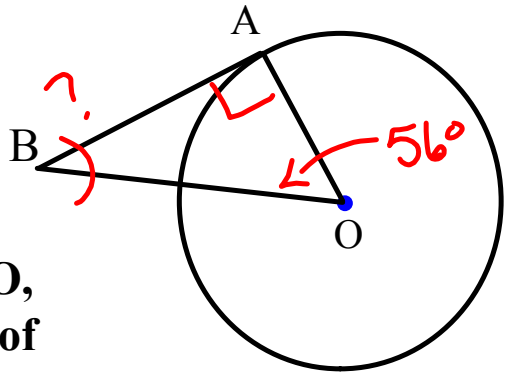


$OW = 6405.6$ Km

"c"

Determining the Measure of an Angle in a Triangle

REMEMBER: "SATT" (the sum of the angles in a triangle theorem) - the sum of the three angles in any triangle is ALWAYS 180°



Point O is the centre of a circle, and AB is a tangent to the circle. In ΔABO, <AOB = 56°. Determine the measure of <ABO.

ANSWER:

∠AOB = 56° (GIVEN)

∠BAO = 90° (TRP)

∠ABO = 34° (SATT)

CONCEPT REINFORCEMENT:

MMS9:
PAGE 388: #3, #5 & #6
PAGE 389: #7 & #9
PAGE 390: #13, #14, & **#17**

Attachments

Section 8.1 Sticky Note Activity.docx