April 25 & 26, 2018

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?

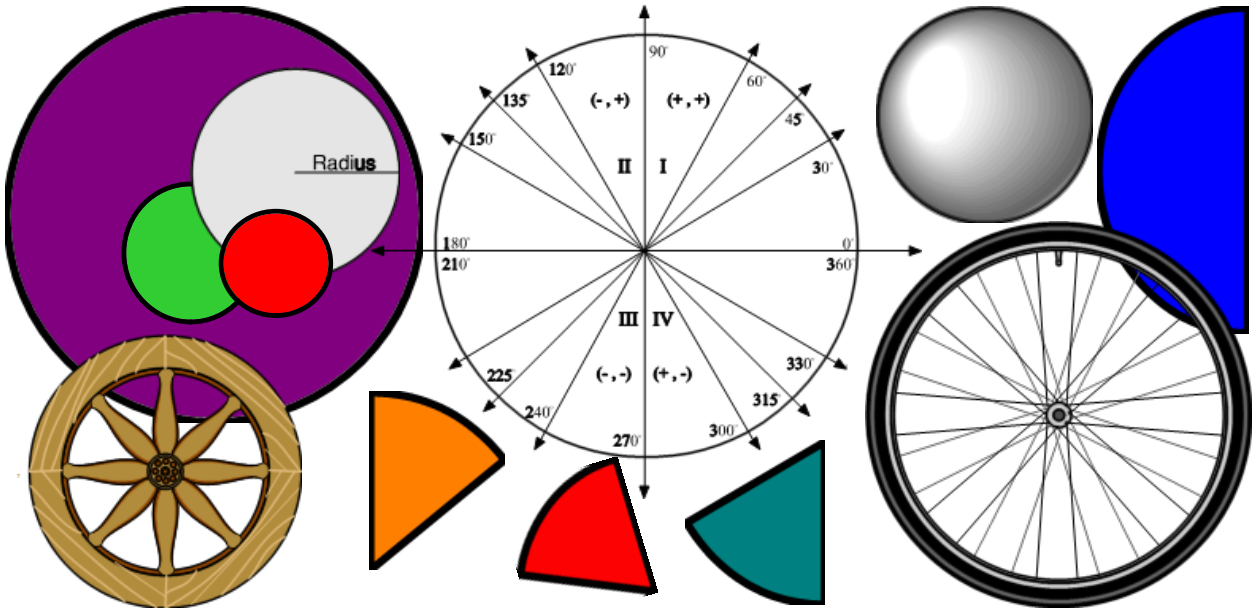
We will begin working on the Math 9 Specific Curriculum Outcome (SCO) "Shape and Space 1" OR "SS1" which states:

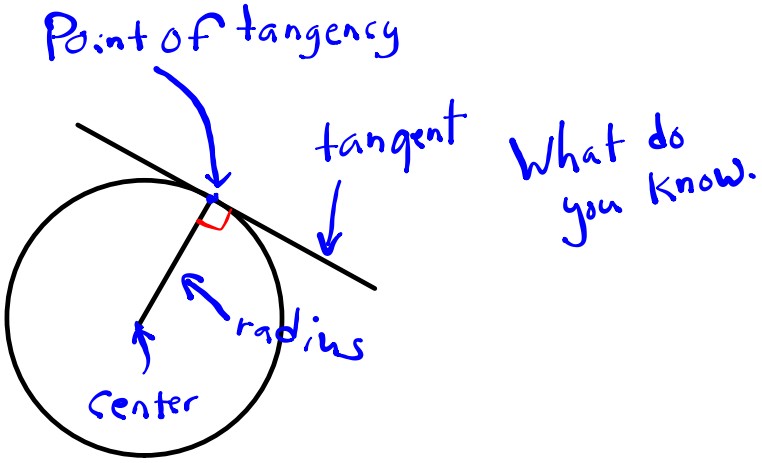
"Solve problems and justify the solution strategy using circle properties, including:

- **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".

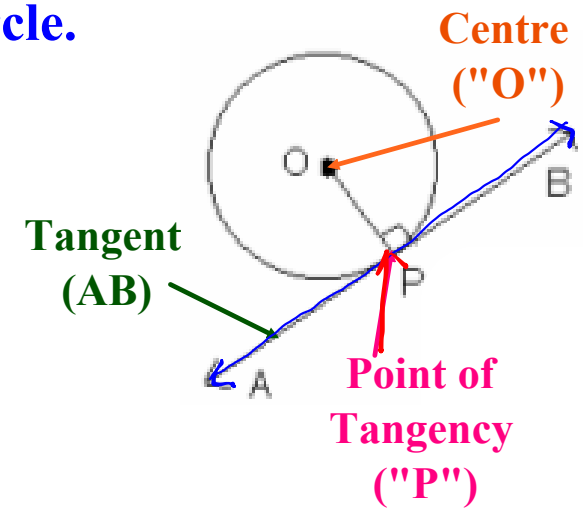




VOCABULARY:

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

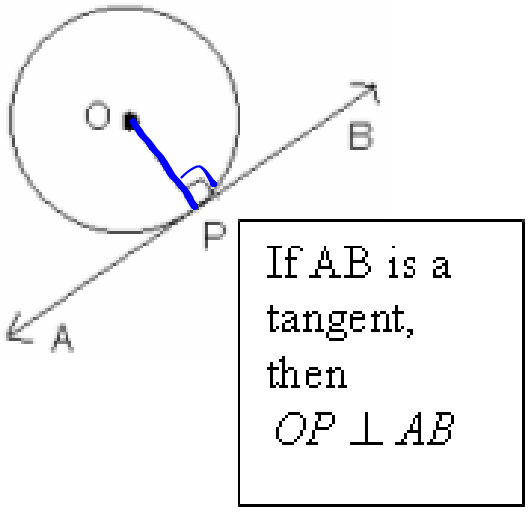
(Please turn to *MMS9*, page 385 for a moment.)

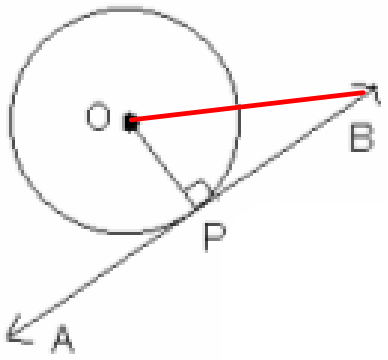


VOCABULARY:

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

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



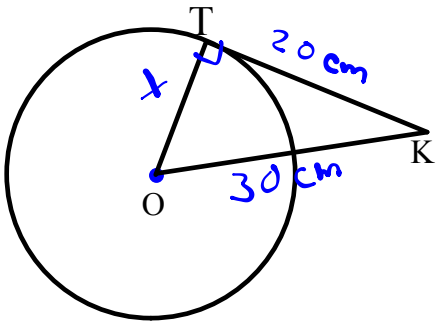


By joining "O" with "B", a right triangle is formed. What theorem could you use to find a missing side length here?

THE PYTHAGOREAN THEOREM!!!

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:

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

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

$x^2 = 30^2 - 20^2$

$= 900 - 400$

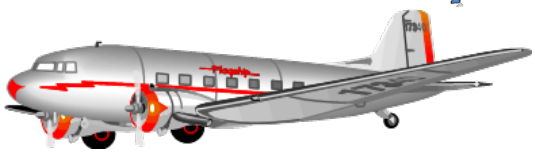
$= 500$

$x = \sqrt{500}$

≈ 22.4 cm

Answer: OT = 22.4 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.

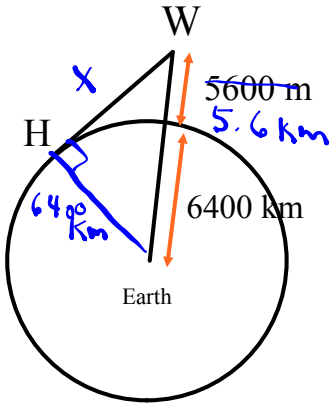
$a^2 = c^2 - b^2$

$x^2 = 6405.6^2 - 6400^2$

$= 71711.36$

$x = \sqrt{71711.36}$

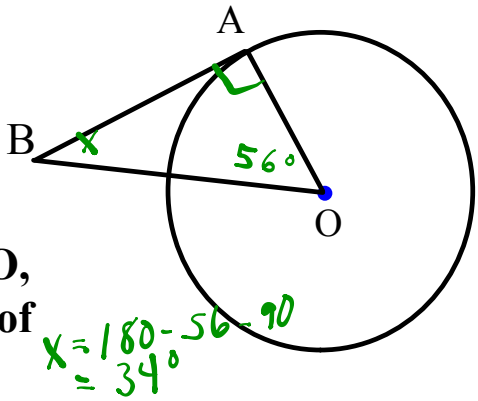
$= 267.8 \text{ Km}$



ANSWER: 268 km

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.

$x = 180 - 56 - 90$

$= 34°$

ANSWER: 34°

CONCEPT REINFORCEMENT:

MMS9:

PAGE 388: #3, #5 & #6

PAGE 389: #7, #9, #11 & #12

PAGE 390: #13, #14, #17 & #18

PAGE 391: #19, #20 & #22

Attachments

Section 8.1 Sticky Note Activity.docx