Inscribed Angles

Lessons 9 and 10

Standards:

MM2G3b: Understand and use properties of chords, tangents, and secants as an application of triangle similarity.

MM2G3d: Justify measurements and relationships in circles using geometric and algebraic properties.

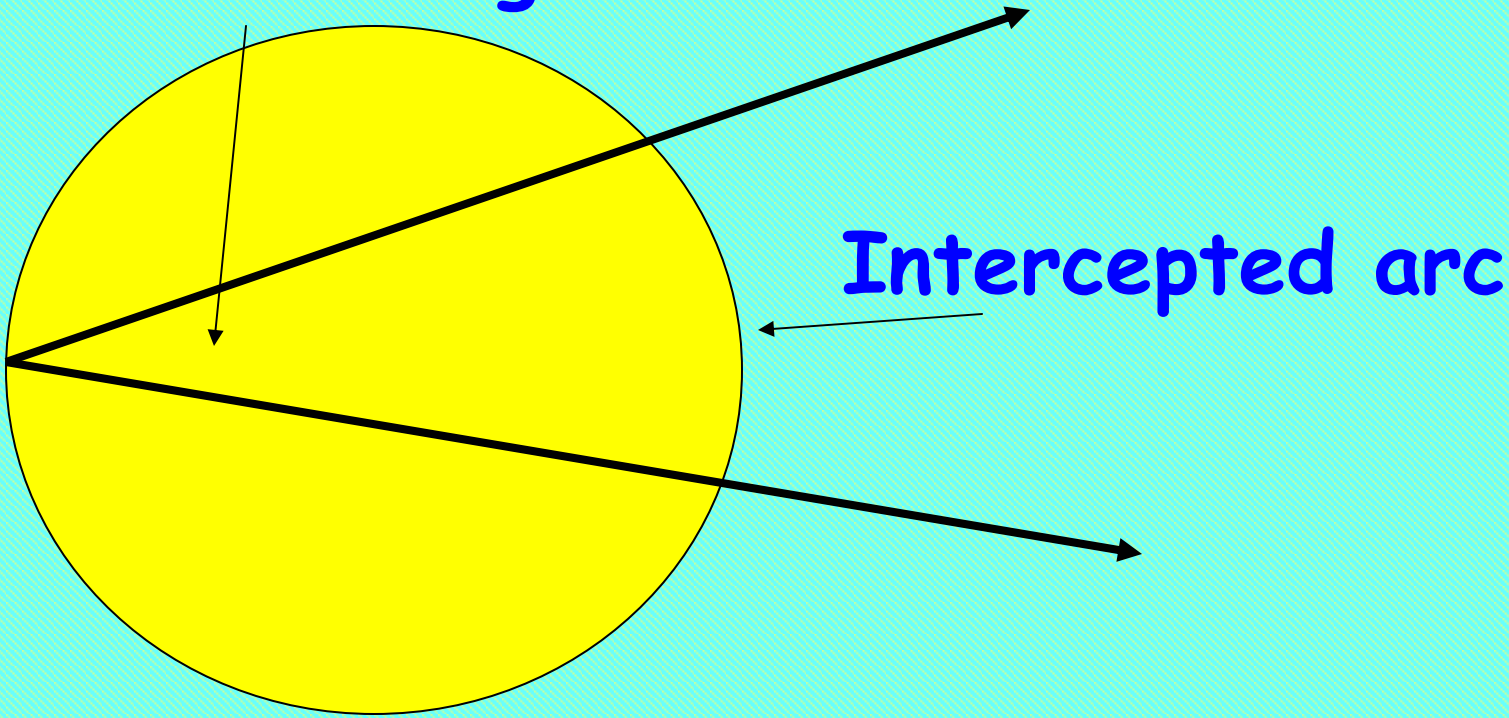
Essential Question:

How do you use inscribed angles to solve problems?

An **inscribed angle** is an angle whose vertex is on a circle and whose sides contain chords of the circle.

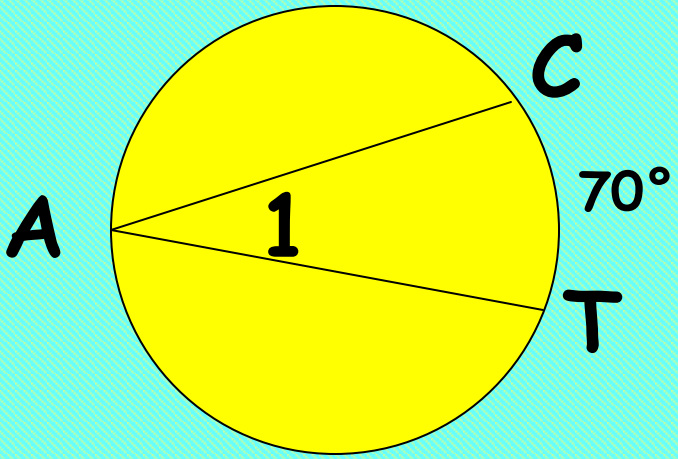
The arc that lies in the interior of an inscribed angle and has endpoints on the angle is called the **intercepted arc** of the angle.

Inscribed angle



Intercepted arc

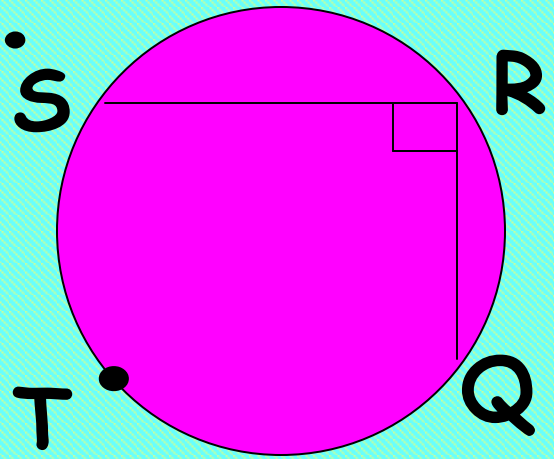
If an angle is inscribed in a circle, then its measure is **half** the measure of its intercepted arc.



$\angle 1 = 35°$

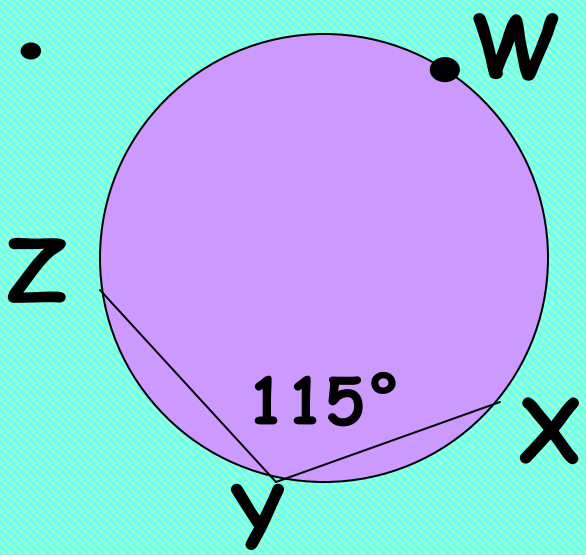
Example: Find the measure of the arc or $\angle$.

a.



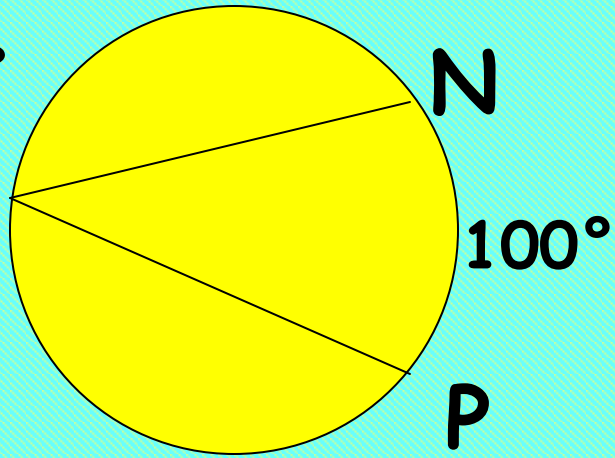
$m\overset{\frown}{QTS} = 180°$

b.



$m\overset{\frown}{ZWX} = 230°$

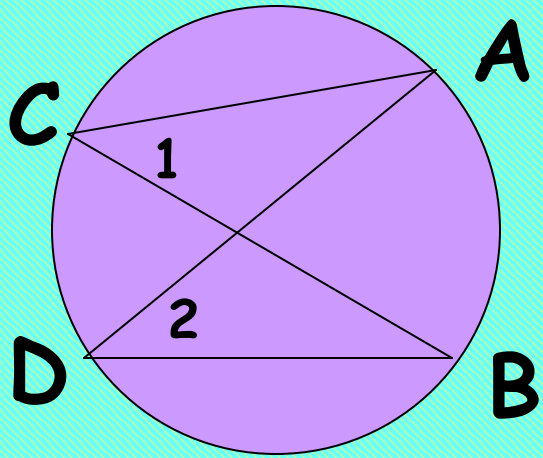
C.



$m\angle NMP = 50°$

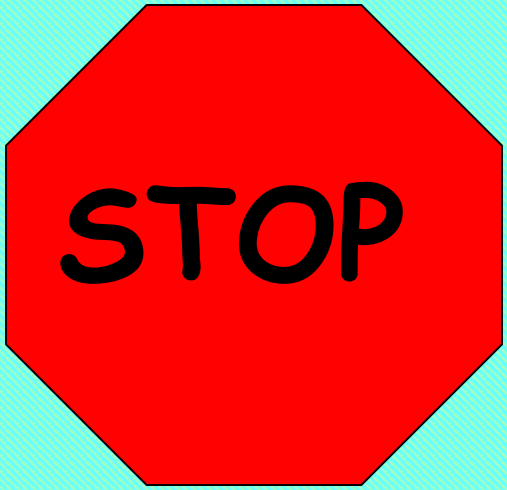
Theorem 10.9

If two inscribed angles of a circle intercept the same arc, then the angles are ≅ .



$\angle 1 \cong \angle 2$

$\angle CAD \cong \angle CBD$



Complete practice A worksheet

Standards:

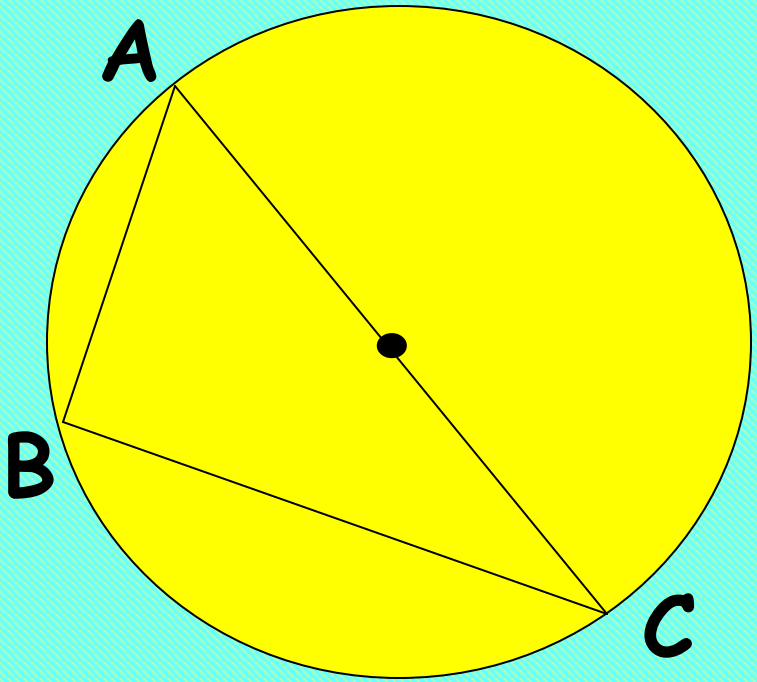
MM2G3d: Justify measurements and relationships in circles using geometric and algebraic properties.

Essential Question:

How do you use the properties of inscribed angles?

An angle inscribed in a semicircle is a **right** angle.

The measure of an angle inscribed in a semicircle is **90°**.

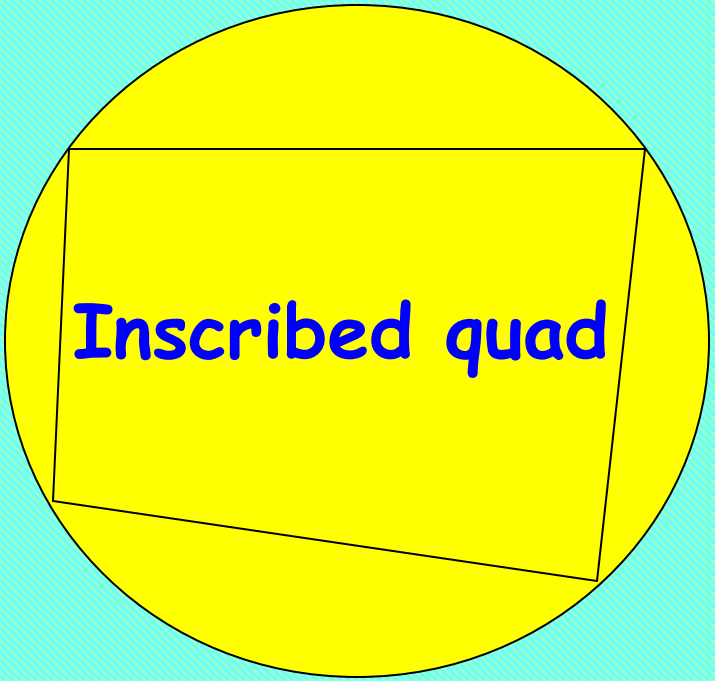


$\overline{AC}$ is a diameter

$\angle ABC$ is a right $\angle$

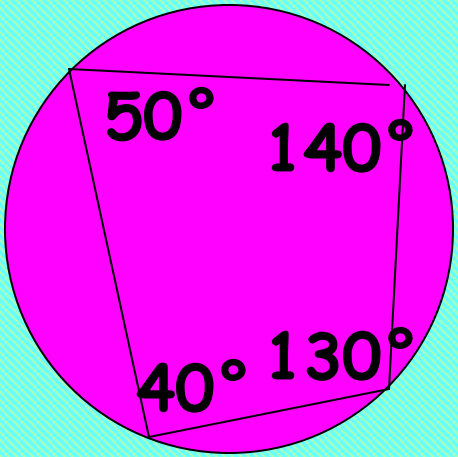
If all of the vertices of a polygon lie on a circle, the polygon is **inscribed** in the circle and the circle is **circumscribed** about the polygon.

The polygon is an **inscribed** polygon and the circle is a **circumscribed** circle.



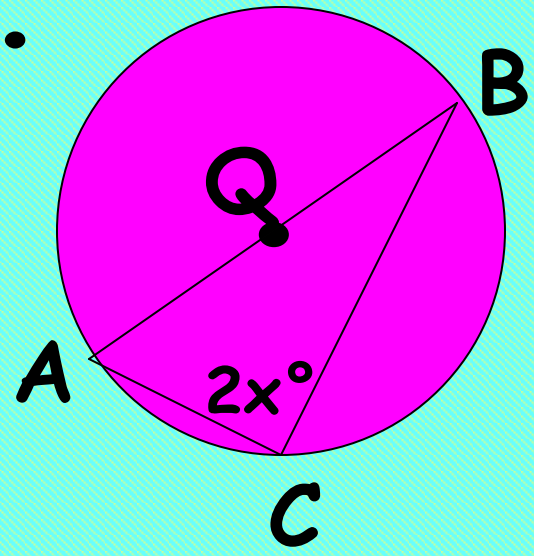
Circumscribed circle

A quadrilateral can be inscribed in a circle if and only if its opposite angles are **supplementary**.



Example: Find the value of each variable.

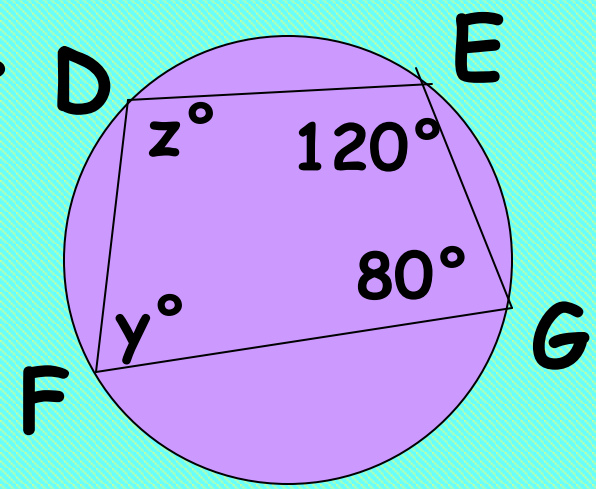
a.



$2x° = 90$

$x = 45°$

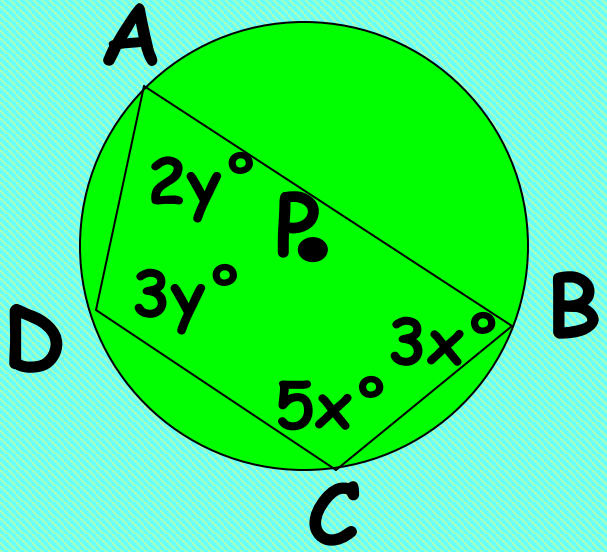
b.



$y = 60°$

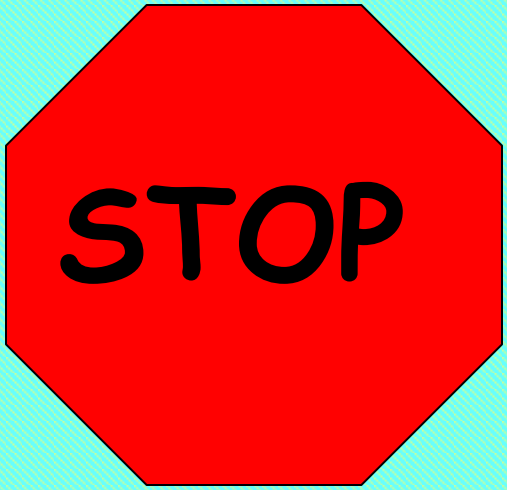
$z = 100°$

C.



$x = 20°$

$y = 40°$



Complete practice B worksheet

Homework Assignment: