Chapter 10
Circles

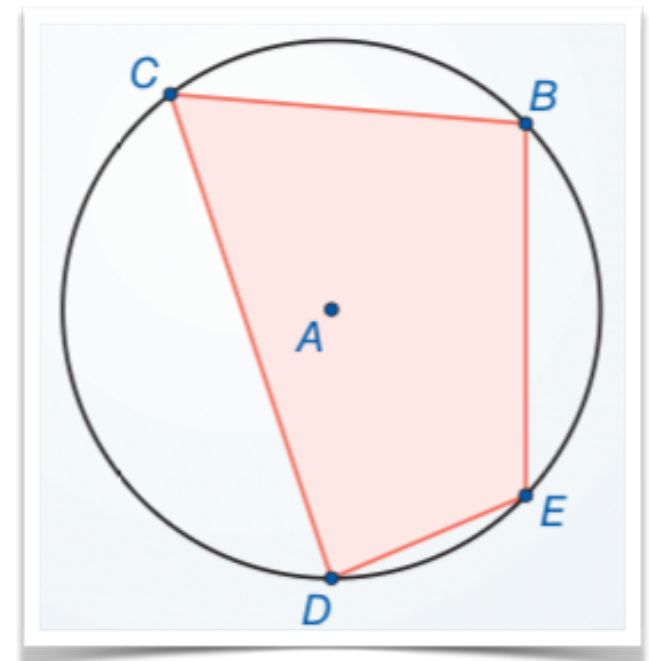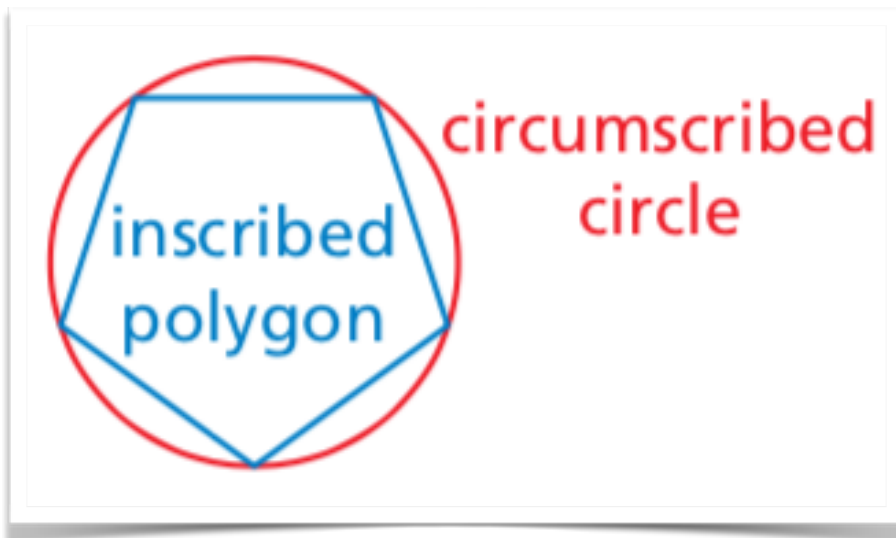# 10.4 Inscribed Angles and Polygons

Vocabulary

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

- **Intercepted arc** - An arc that lies between two lines, rays, or segments.
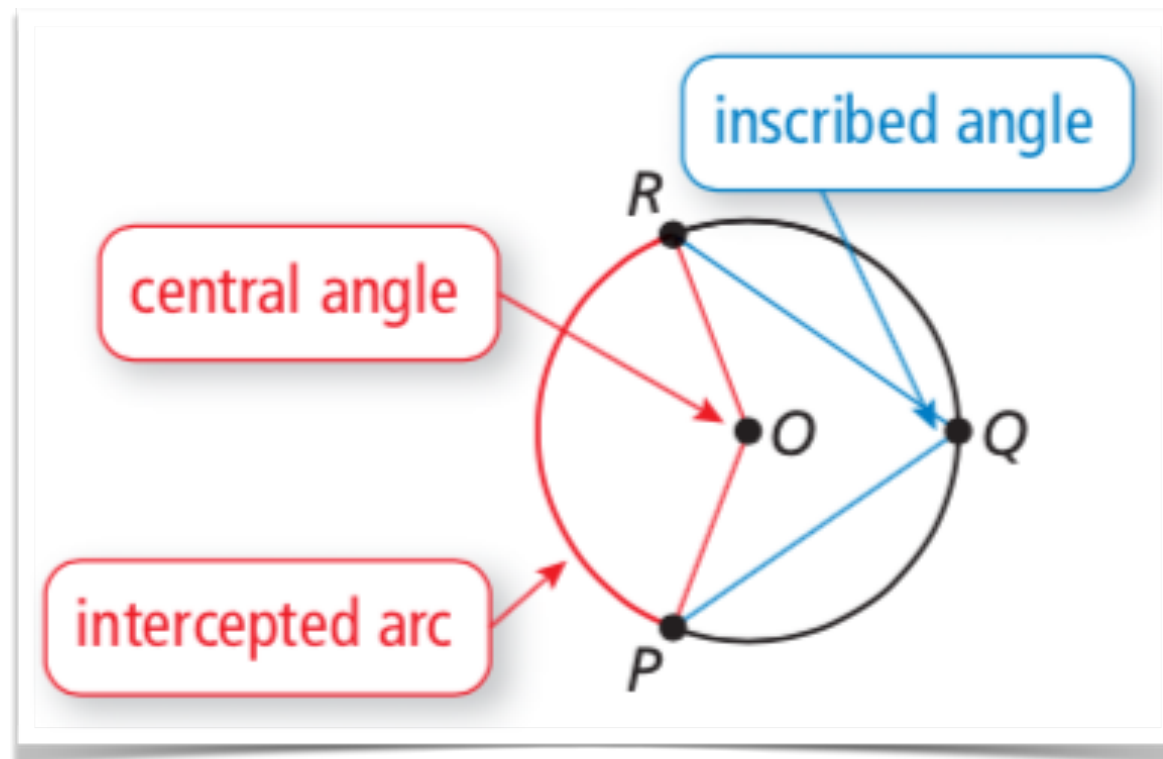
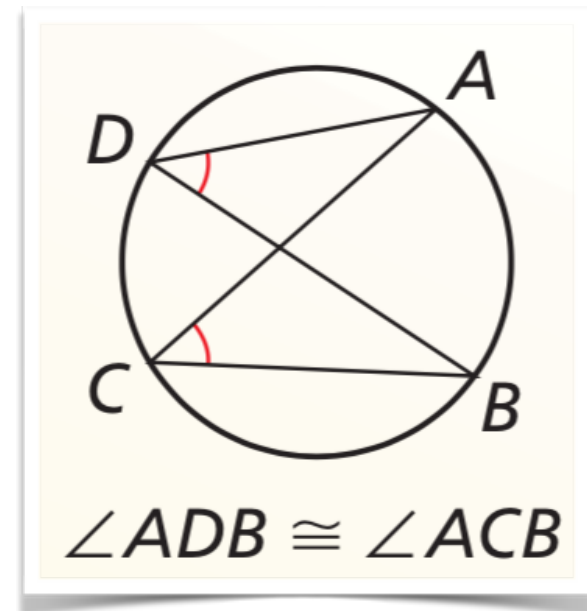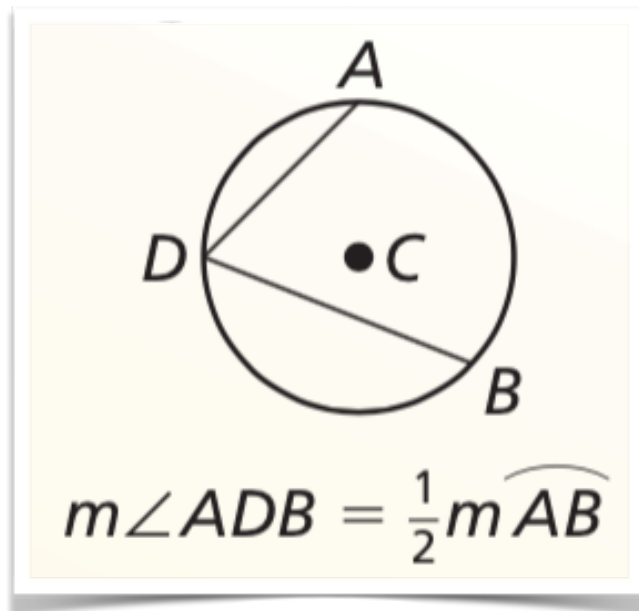# 10.4 Inscribed Angles and Polygons

Vocabulary

- **Inscribed polygon** - A polygon whose vertices all lie on one circle.

- **Circumscribed circle** - The circle that contains all the vertices of an inscribed polygon.

10.4 Inscribed Angles and Polygons

Theorems

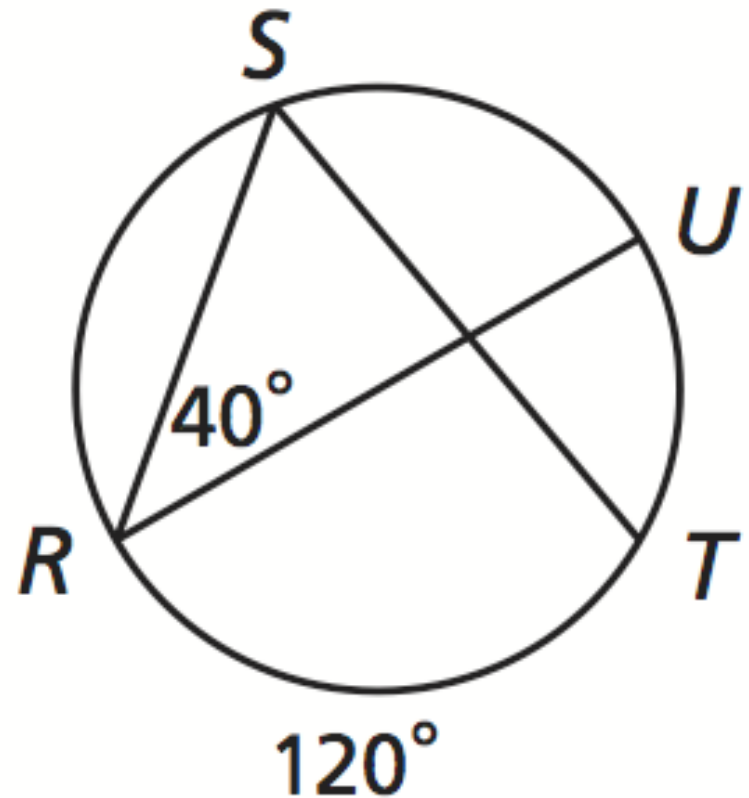| Inscribed Angle Theorem	The measure of an inscribed angle is one-half the measure of its intercepted arc.
Inscribed Angles of a Circle Theorem	If two inscribed angles of a circle intercept the same arc, then the angles are congruent.

$$m\angle ADB = \tfrac{1}{2}m\overarc{AB}$$

$$\angle ADB \cong \angle ACB$$

Example

$m\angle RST =$

$m\overset{\frown}{SU} =$
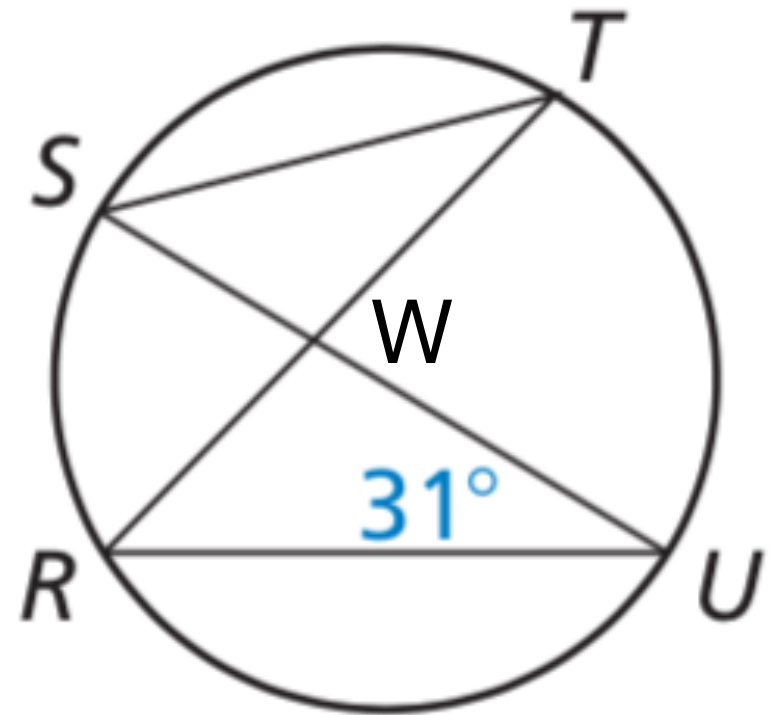
10.4 Inscribed Angles and Polygons

Example

$$m\overset{\frown}{RS} =$$

$$m\angle STR =$$

What can you say about:
$m\angle TSU$ and $m\angle TRU$?

$\triangle TSW$ and $\triangle URW$?
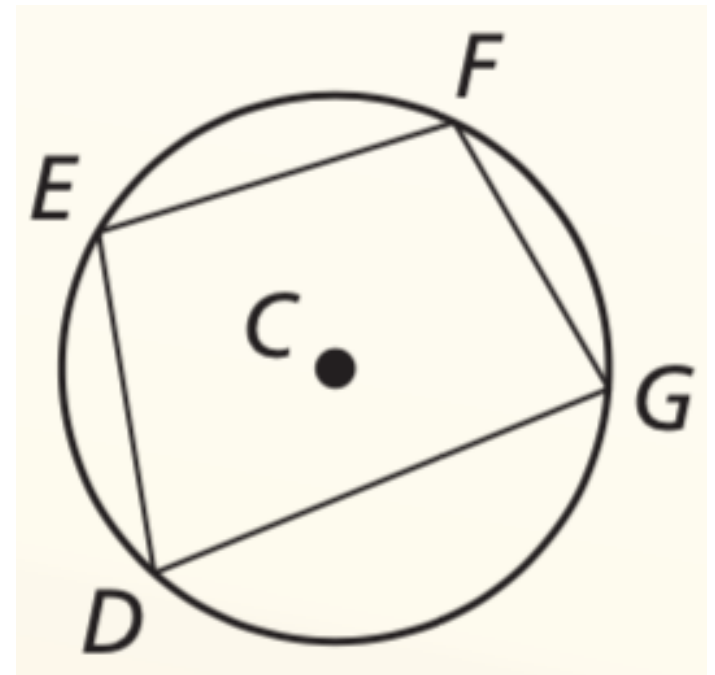
10.4 Inscribed Angles and Polygons

Theorems

Inscribed Right Triangle Theorem	If a right triangle is inscribed in a circle, then **the hypotenuse is a diameter** of the circle. Conversely, if one side of an inscribed triangle is a diameter of the circle, then the triangle is a right triangle and the angle opposite the diameter is the right angle.
Inscribed Quadrilateral Theorem	A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.

Diameter
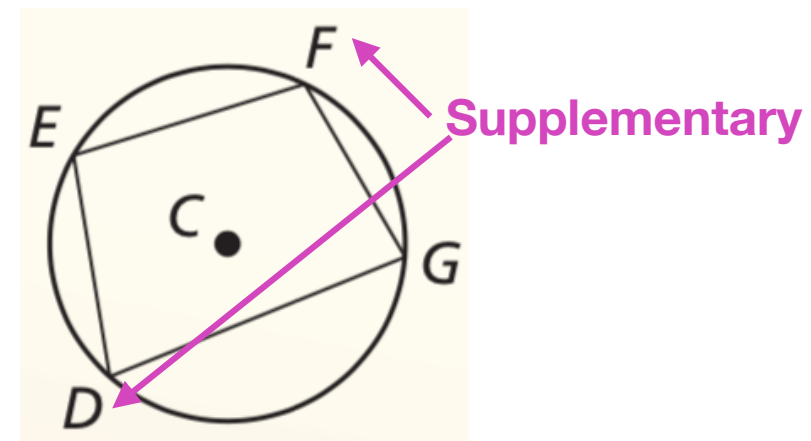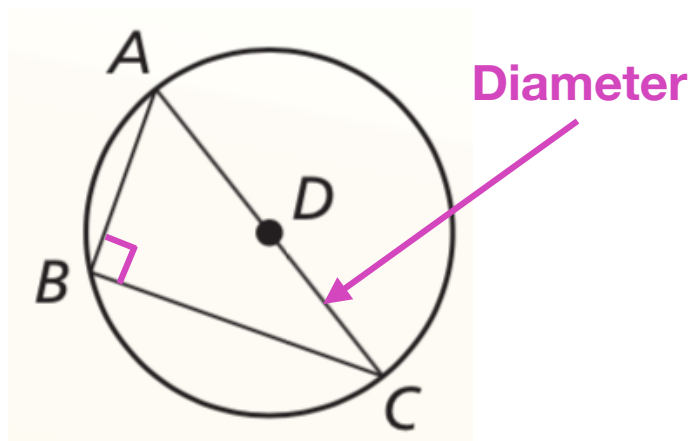
Supplementary

10.4 Inscribed Angles and Polygons

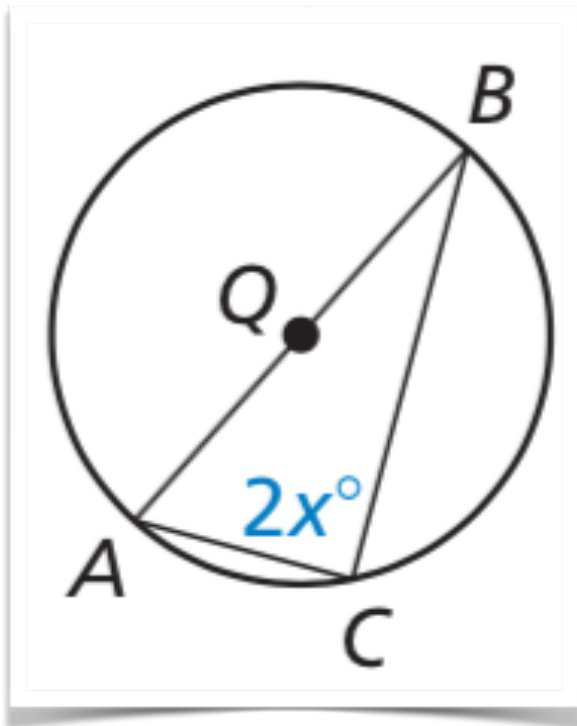Why are ∠F and ∠D supplementary?

(Hint: Use Inscribed Angles Theorem)

10.4 Inscribed Angles and Polygons

Examples

a) Solve for x.

b) Solve for y and z.

B

Q

$2x°$

A

C

D

E

$z°$

$120°$

$80°$

F

$y°$

G