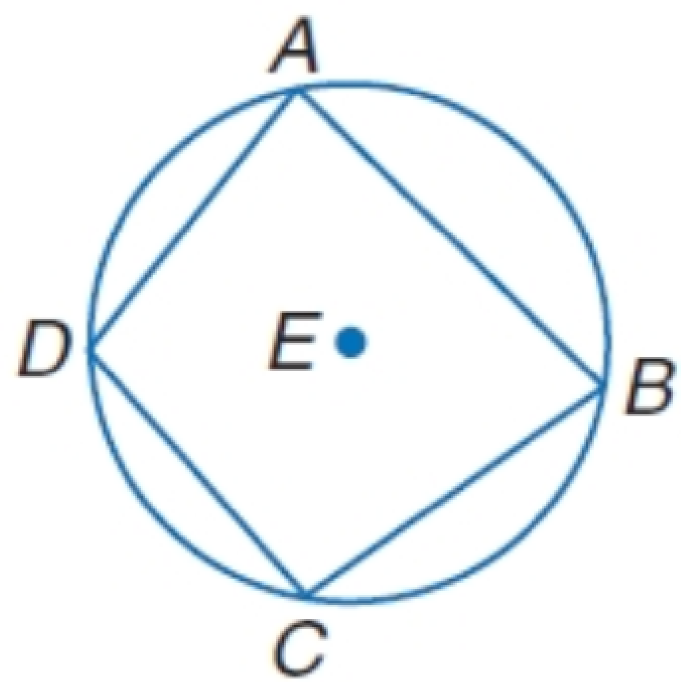
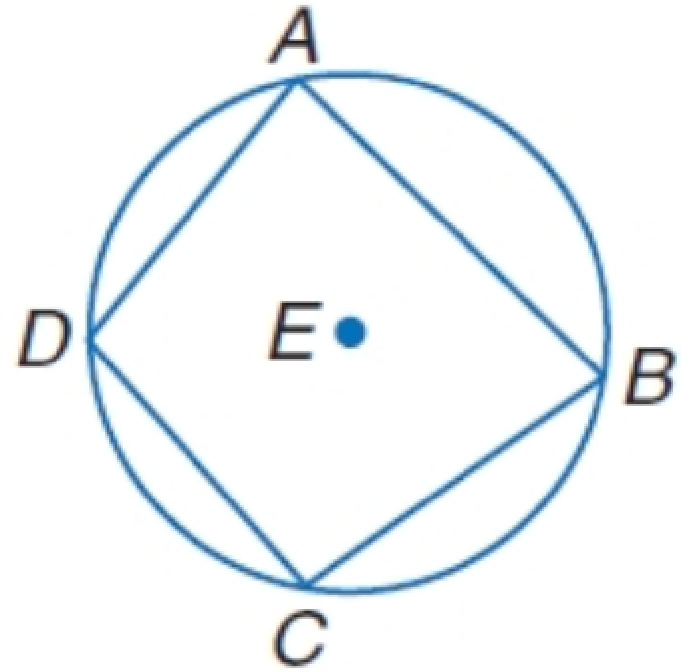
10-3 Arcs & Chords

inscribed: a polygon in which the vertices lie on a circle,



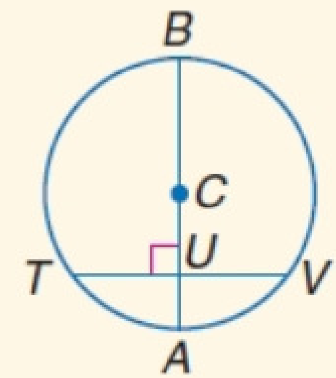
circumscribed: the circle containing all the vertices of a polygon

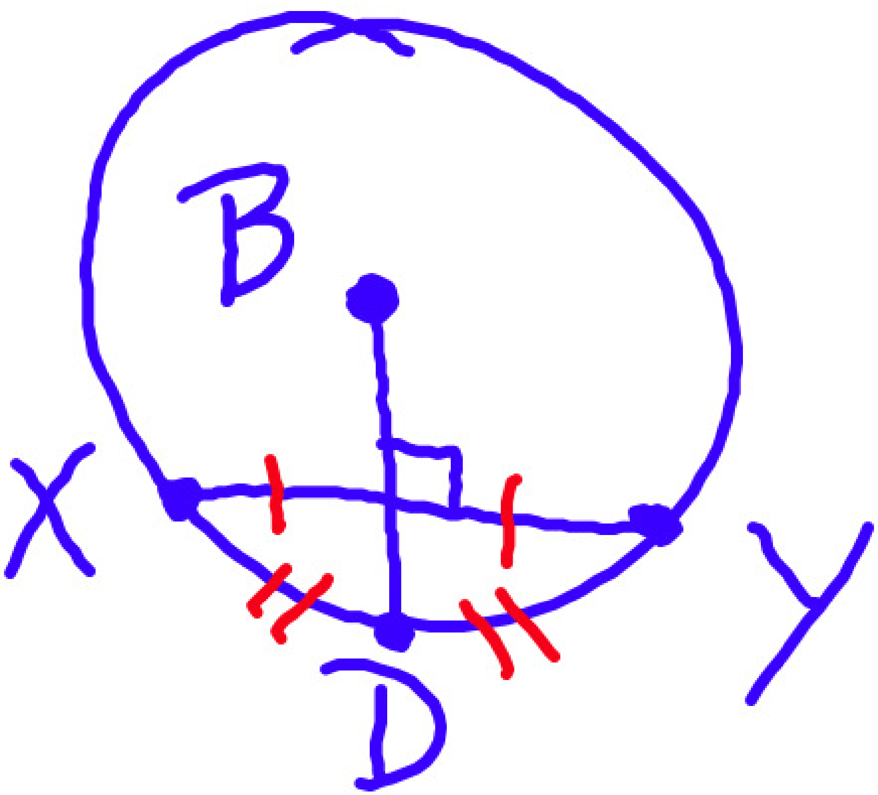


THEOREM 10.3

In a circle, if a diameter (or radius) is perpendicular to a chord, then it bisects the chord and its arc.

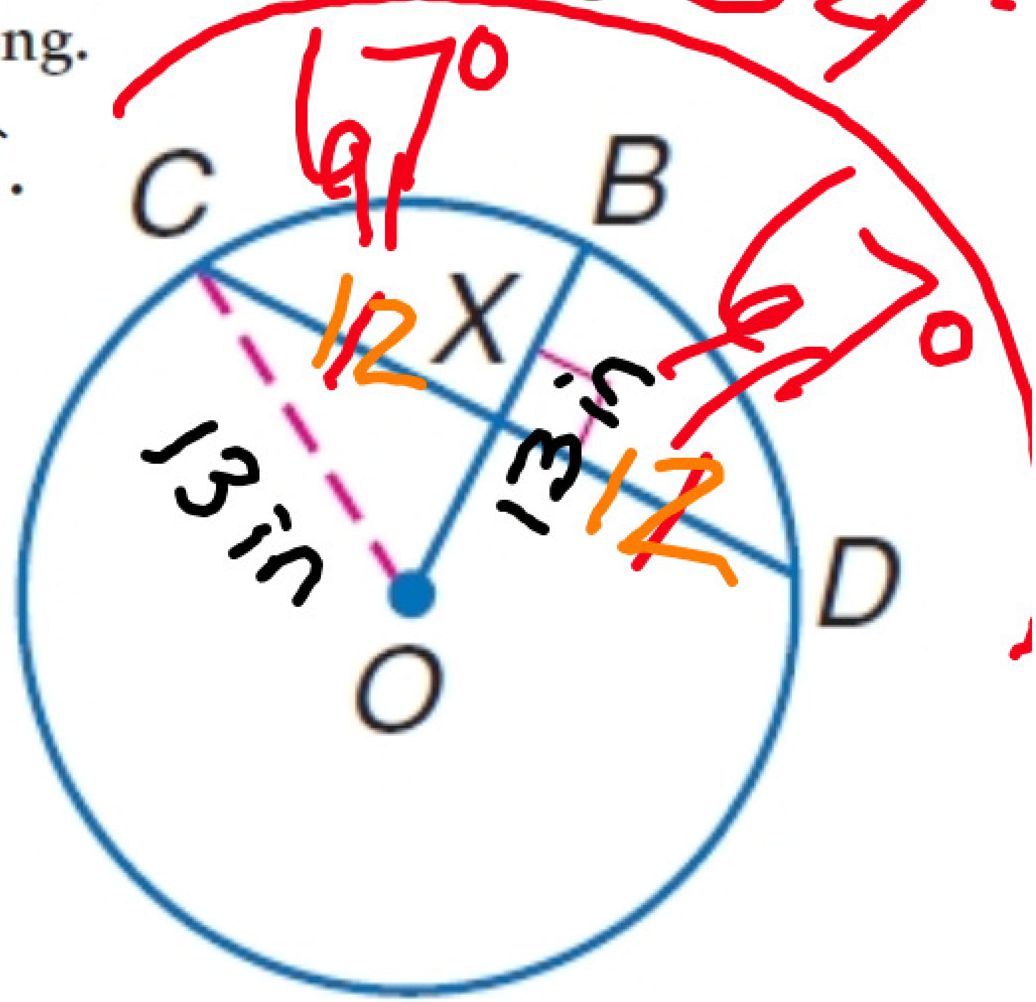
Example: If $\overline{BA} \perp \overline{TV}$, then $\overline{UT} \cong \overline{UV}$ and $\widehat{AT} \cong \widehat{AV}$.





~~Circle O has a radius of 13 inches~~. Radius $\overline{OB}$ is perpendicular to chord $\overline{CD}$, which is 24 inches long.

a. If $m\widehat{CD} = 134$, find $m\widehat{CB}$.



$\overline{CD} = 24$ in

$m\widehat{CB} = 67$

Circle O has a radius of 13 inches. Radius $\overline{OB}$ is perpendicular to chord $\overline{CD}$, which is 24 inches long.

b. Find OX.

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

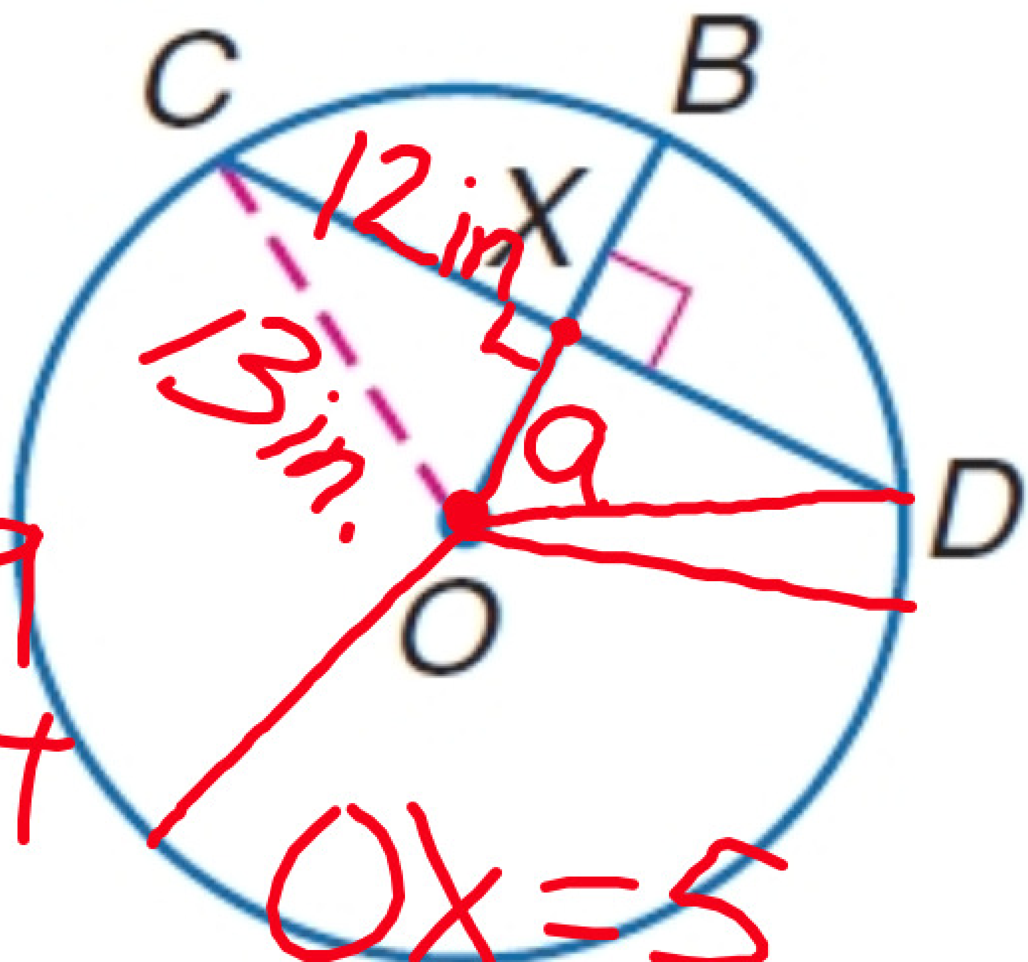
$$a^2+12^2=13^2$$

$$a^2+\cancel{144}=169$$

$$\underline{-\cancel{144}\quad -144}$$

$$\sqrt{a^2}=\sqrt{25}$$

$$a=5$$

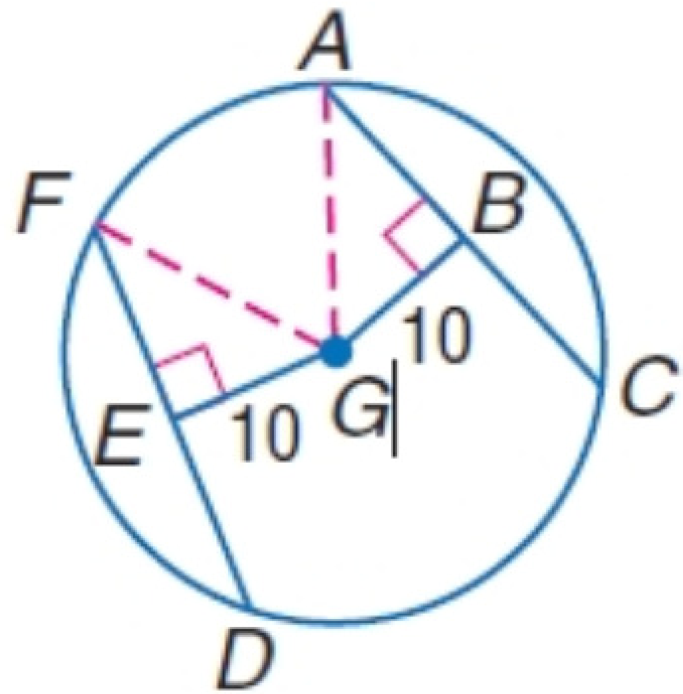


$OX=5$

THEOREM 10.4

In a circle or in congruent circles, two chords are congruent if and only if they are equidistant from the center.

Chords $\overline{AC}$ and $\overline{DF}$ are equidistant from the center. If the radius of $\odot G$ is 26, find AC and DE.



Chords $\overline{AC}$ and $\overline{DF}$ are equidistant from the center. If the radius of $\odot G$ is 26, find AC and DE.

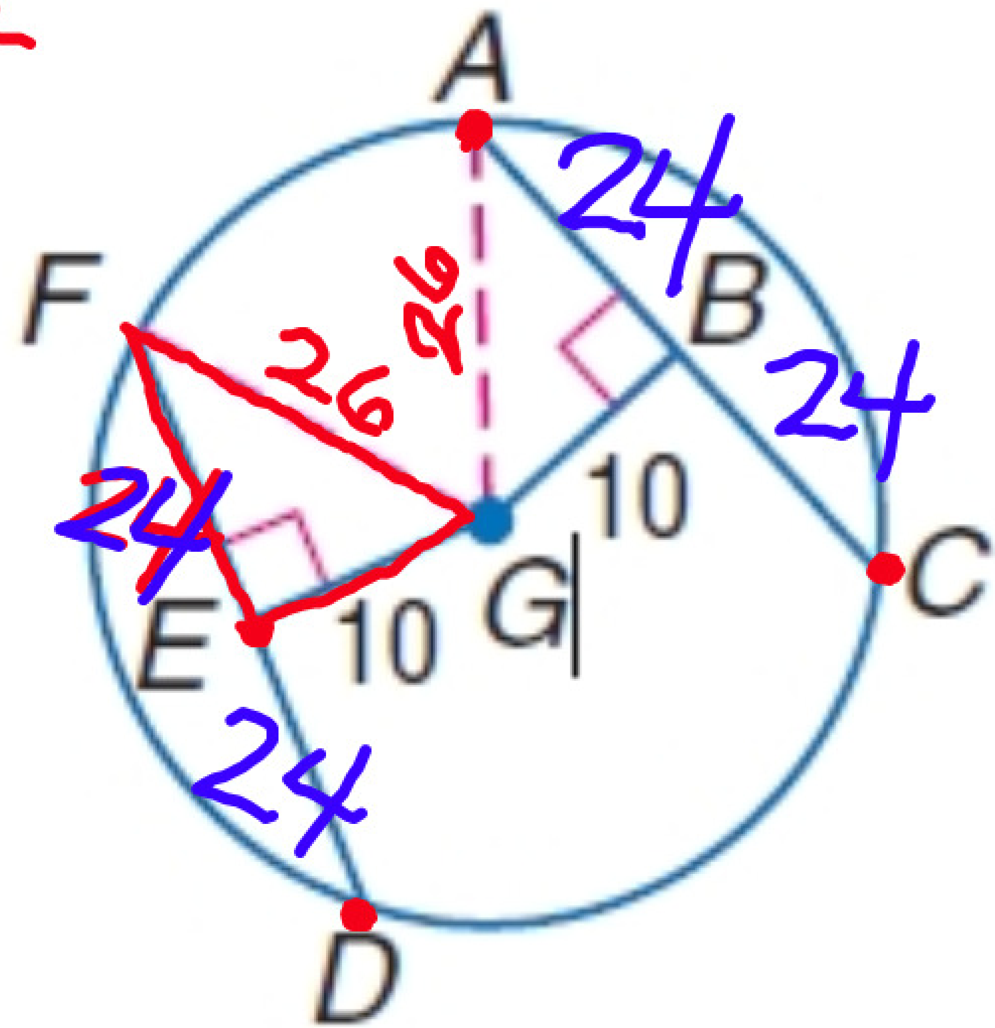
$10^2 + b^2 = 26^2$

$100 + b^2 = 676$

$-100 \qquad -100$

$\sqrt{b^2} = \sqrt{576}$

$b = 24$



$AC = 48$

$DE = 24$