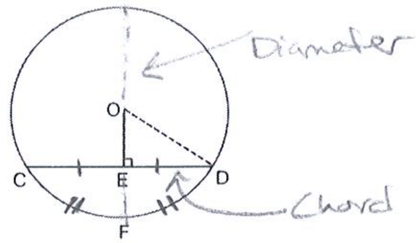
Geometry Name: Key
Arcs and Chords Date: ____________

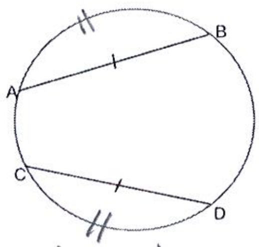
In a circle, if a <u>diameter</u> is perpendicular to a <u>chord</u>, then it <u>bisects</u> the chord and its arc.

$m\overset{\frown}{CF} \cong m\overset{\frown}{FD}$
and
$\overline{CE} \cong \overline{ED}$



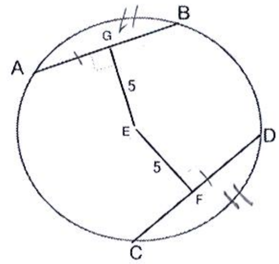
In a circle or in congruent circles, <u>2 minor arcs</u> are congruent if and only if their <u>corresponding chords</u> are congruent.

Given $\overline{AB} \cong \overline{CD}$
then $\overset{\frown}{AB} \cong \overset{\frown}{CD}$



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

Since $EG = EF$,
then $\overline{AB} \cong \overline{CD}$
and $\overset{\frown}{AB} \cong \overset{\frown}{CD}$

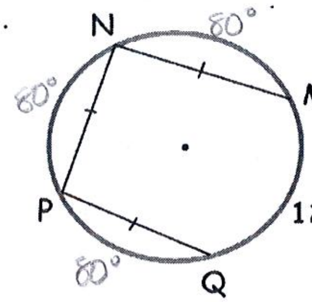


Examples

360-120=240°

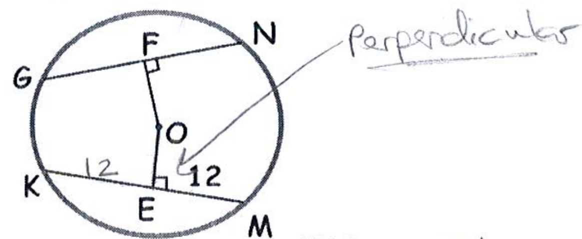
$\frac{240°}{3} = 80°$

1.



$\overset{\frown}{NP}$ = <u>80°</u>

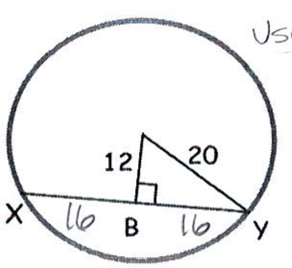
2.



KM = <u>24</u>

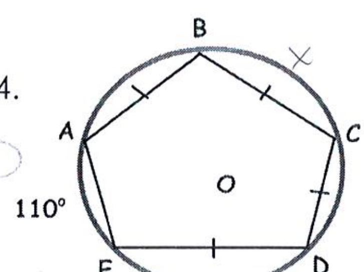
3.

Use Pythagorean Thrm
$x^2+12^2=20^2$
$x^2+144=400$
$\sqrt{x^2}=\sqrt{256}$ $x=16$



XY = <u>32</u>

4.



360-110=250
$\frac{250}{4}=62.5$

$m\overset{\frown}{BC}$ = <u>62.5°</u>

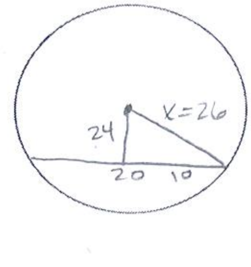
5. Suppose a chord is 20 inches long and is 24 inches from the center of the circle. Find the length of the radius.

$10^2+24^2=x^2$

$100+576=x^2$

$676=x^2$

$\boxed{x=26 \text{ inches}}$



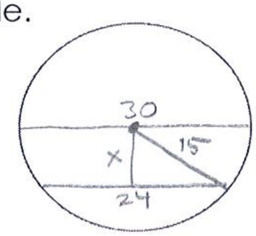
6. Suppose the diameter of a circle is 30 centimeters long and a chord is 24 centimeters long. Find the distance between the chord and the center of the circle.

$x^2+12^2=15^2$

$x^2+144=225$

$\sqrt{x^2}=\sqrt{81}$

$\boxed{x=9\text{cm}}$



7. Find the length of a chord that is 5 inches from the center of a circle with a radius of 13 inches.

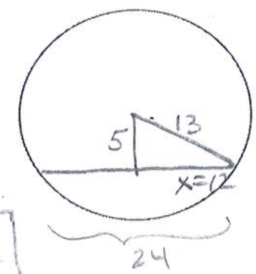
$5^2+x^2=13^2$

$25+x^2=169$

$\sqrt{x^2}=\sqrt{144}$

$x=12$

$\boxed{\text{Chord length}=24 \text{ in}}$



8. Suppose a radius of a circle is 17 units and a chord is 30 units long. Find the distance from the center of the circle to the chord.

$x^2+15^2=17^2$

$x^2+225=289$

$\sqrt{x^2}=\sqrt{64}$

$\boxed{x=8 \text{ units}}$