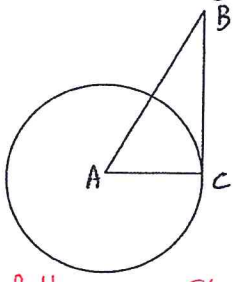
Focus on Tangents, Arc Measures, & Chords

Unit 7: Circles

For each of the following identify if the line that appears to be tangent really is. Explain your answer.

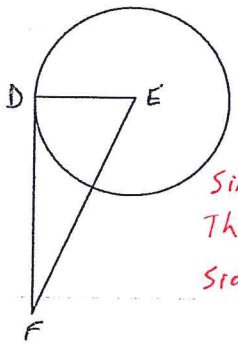
1.



$AB = 5 = c$
$BC = 4 = b$
$AC = 3 = a$
$a^2 + b^2 = c^2$
$3^2 + 4^2 = 5^2$
$9 + 16 = 25$
$25 = 25$

Since Pythagorean Thm shows the two sides are equal, TANGENT

2.

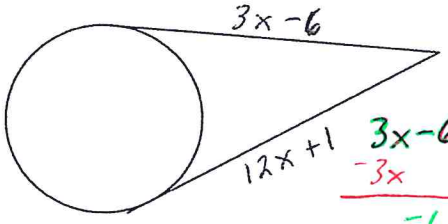


$DE = 3 = a$
$EF = 15 = c$
$DF = 12 = b$
$3^2 + 12^2 = 15^2$
$9 + 144 = 225$
$153 = 225$
$153 \neq 225$

Since Pythagorean Thm shows the two sides are NOT equal, Not TANGENT

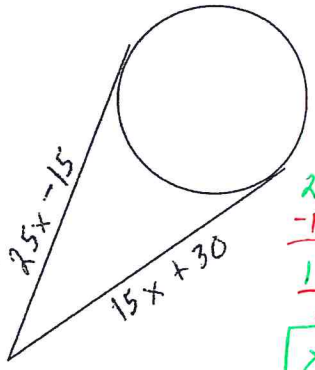
Find the value of the variable.

3.



$3x - 6 = 12x + 1$
$-3x \quad -3x$
$-6 = 9x + 1$
$-1 \quad -1$
$\frac{-7}{9} = \frac{9x}{9}$
$x = \frac{-7}{9}$

4.



$25x - 15 = 15x + 30$
$+15 \quad +15$
$25x = 15x + 45$
$-15x \quad -15x$
$\frac{10x}{10} = \frac{45}{10}$
$x = \frac{45}{10}$ OR 4.5

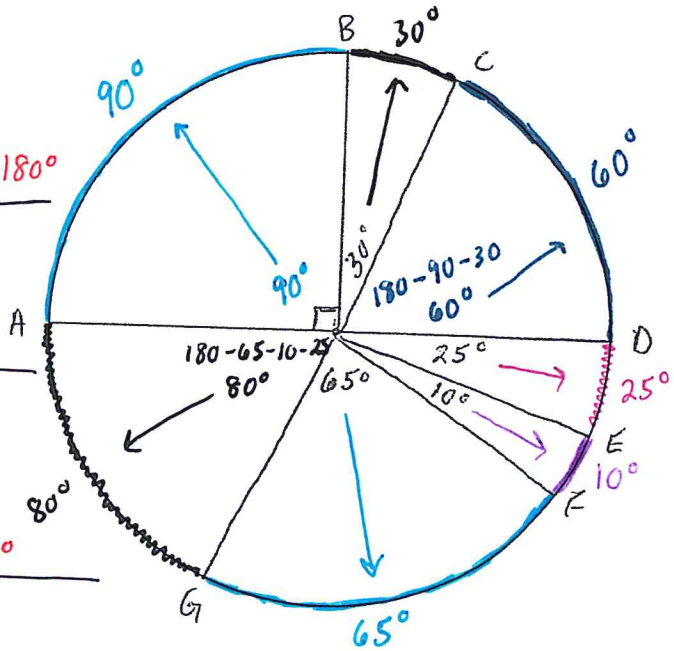
Given the following figure find the arc measure indicated, and then indicate if the measure is a minor arc, major arc, or semicircle.

5. Find $\overset{\frown}{ABC} = \overset{\frown}{AB} + \overset{\frown}{BC}$
$= 90° + 30° = 120°$
minor since less than 180°

6. Find $\overset{\frown}{AG} = 180° - \overset{\frown}{GF} - \overset{\frown}{FE} - \overset{\frown}{ED}$
$= 180° - 65° - 10° - 25°$
$= 80°$
minor since less than 180°

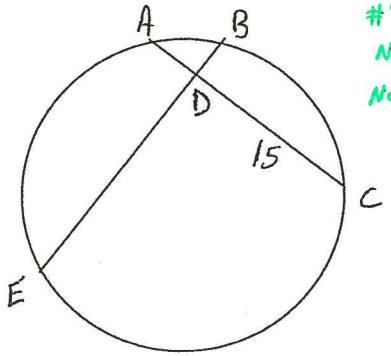
7. Find $\overset{\frown}{AGD} = \overset{\frown}{AG} + \overset{\frown}{GF} + \overset{\frown}{FE} + \overset{\frown}{ED}$
$= 80° + 65° + 10° + 25°$
$= 180°$
Semicircle since equal to 180°

8. Find $\overset{\frown}{CD} = 180° - \overset{\frown}{AB} - \overset{\frown}{BC}$
$= 180° - 90° - 30°$
$= 60°$
minor since less than 180°



Identify if the following chords are perpendicular bisectors of each other or not. Then give the value of the indicated segment.

9.

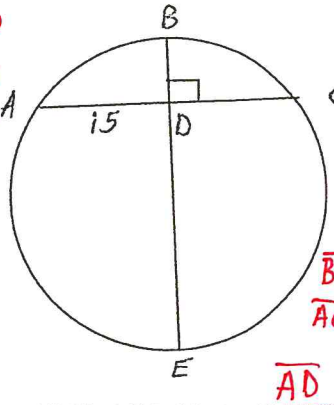


#9
NO — $\overline{BE}$ a Diameter?
No — Is $\overline{BE} \perp$ to $\overline{AC}$?

Find $\overline{AD}$.

Since both are a no, Not enough information

10.



#10
Yes — $\overline{BE}$ a Diameter?
Yes — Is $\overline{BE} \perp$ to $\overline{AC}$?

Since both are yes, $\overline{BE}$ bisects $\overline{AC}$. meaning:

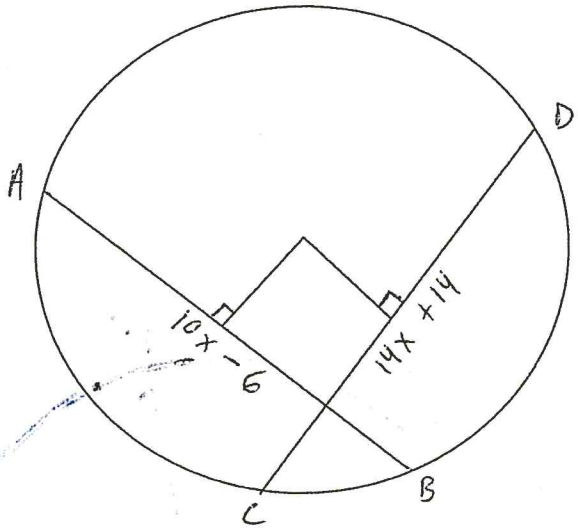
$\overline{AD} = \overline{DC}$

$15 = \overline{DC}$

Find $\overline{DC}$.

Find the value of the variable, then find the measure of the chord indicated.

11



Find $\overline{AB}$.

$10x - 6 = 14x + 14$

$-14 \quad -14$

$10x - 20 = 14x$

$-10x \quad -10x$

$\frac{-20}{4} = \frac{4x}{4}$

$-5 = x$

$\overline{AB} = 10x - 6$

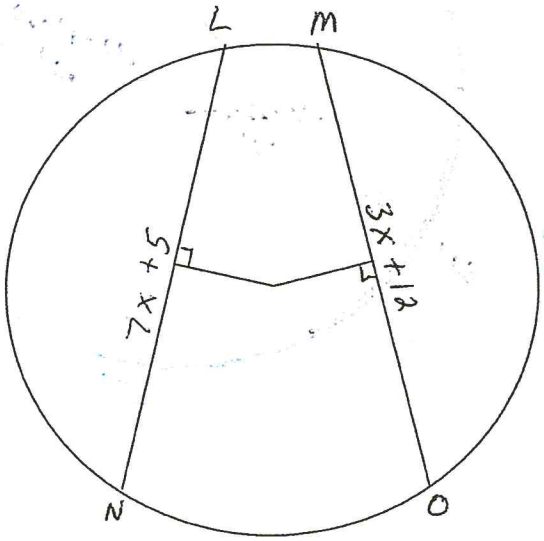
$= 10(-5) - 6$

$= -50 - 6$

$= -56$

Length should never be negative however I have never altered this question so its ok.

12.



Find $\overline{MO}$

$7x + 5 = 3x + 12$

$-5 \quad -5$

$7x = 3x + 7$

$-3x \quad -3x$

$\frac{4x}{4} = \frac{7}{4}$

$x = \frac{7}{4}$

$\overline{MO} = 3x + 12$

$= \frac{3}{1}\left(\frac{7}{4}\right) + \frac{12}{1}$

$= \frac{21}{4} + \frac{12 \cdot 4}{1 \cdot 4}$

$= \frac{21}{4} + \frac{48}{4} = \frac{69}{4}$ or 17.25