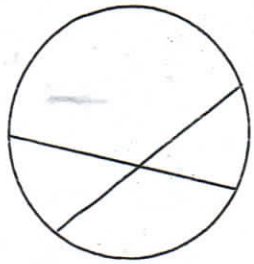
Geometry Notes

Name _____

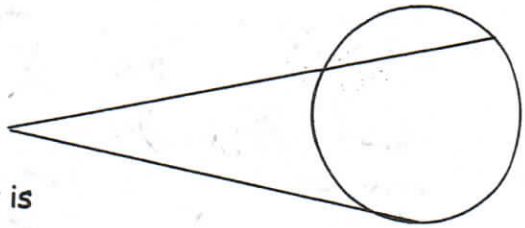
10.6 Find Segment Lengths in Circles

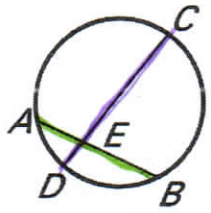
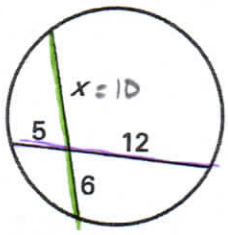
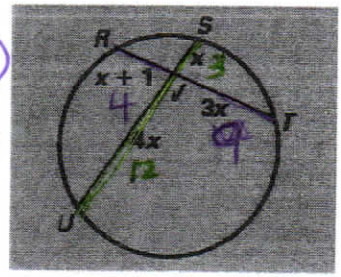
Segments of the Chord: when two chords intersect in the interior of a circle, each chord is divided into two segments called segments of the chord.



Secant Segment: a secant segment is a segment that contains a chord of a circle, and has exactly one endpoint outside the circle.

External Segment
An external segment is the part of a secant segment that is *outside* the circle.



Theorems	Picture/ Description
SEGMENTS OF CHORDS THEOREM If two chords intersect in the interior of a circle, then the **product** of the lengths of the segments of one chord is equal to the **product** of the lengths of the segments of the other chord. part · part = part · part	What are the segments of chord DC? DE, EC What are the segments of chord AB? AE, EB  DE · EC = AE · EB
1. Find x. X(6) = 5(12) 6X = 60 X = 10  Are the chords equal in length? 16, 17 NO.	2. Find x. X(4x) = 3x(x+1) 4x² = 3x² + 3x x² − 3x = 0 x(x − 3) = 0 x = 0 X = 3  Are the chords equal in length? 15, 9 NO.

3. If the chords were equal in problem #2. What could you conclude about arc $\overset{\frown}{US}$?

If $\overline{RT} \cong \overline{SU}$, then $\overset{\frown}{US} \cong \overset{\frown}{RT}$

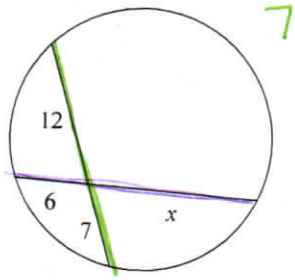
* If the chords are equal, then the intercepted/included arcs are equal

Geometry Name_____ ID: 1

Circle Segments: Chords

Date_____ Period____

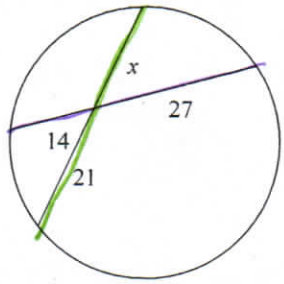
Solve for *x*. Assume that lines which appear tangent are tangent.

1) 

$7(12) = x(6)$

$84 = 6x$

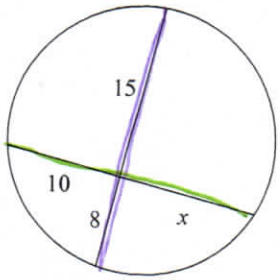
$\boxed{14 = x}$

2) 

$x(21) = 14(27)$

$21x = 378$

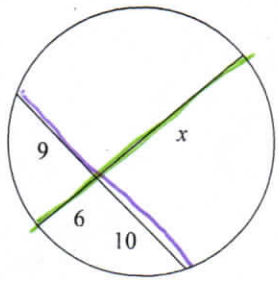
$\boxed{x = 18}$

3) 

$8(15) = x(10)$

$120 = 10x$

$\boxed{12 = x}$

4) 

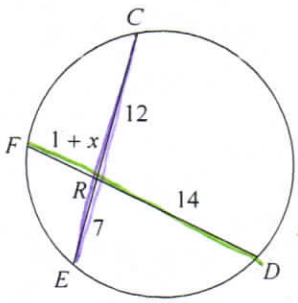
$x(6) = 9(10)$

$6x = 90$

$\boxed{x = 15}$

Find the measure of the line segment indicated. Assume that lines which appear tangent are tangent.

5) Find *DF*



$7(12) = 14(1+x)$

$84 = 14 + 14x$

$70 = 14x$

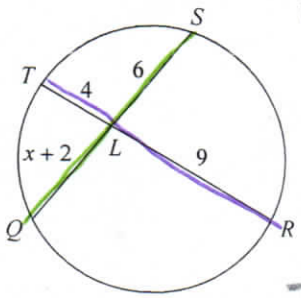
$\boxed{5 = x}$

$DF = 14 + 1 + x$

$= 14 + 1 + 5$

$\boxed{DF = 20}$

6) Find *LQ*



$6(x+2) = 4(9)$

$6x + 12 = 36$

$6x = 24$

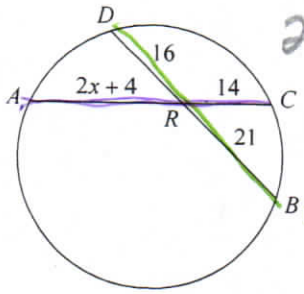
$\boxed{x = 4}$

$LQ = x + 2$

$= 4 + 2$

$\boxed{LQ = 6}$

7) Find *CA*



$14(2x+4) = 16(21)$

$28x + 56 = 336$

$28x = 280$

$\boxed{x = 10}$

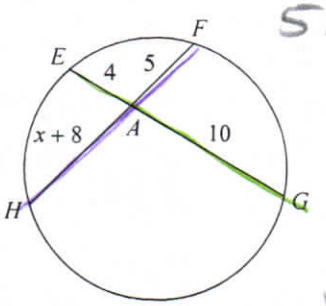
$CA = 2x + 4 + 14$

$= 2(10) + 18$

$= 20 + 18$

$\boxed{CA = 38}$

8) Find *AH*



$5(x+8) = 4(10)$

$5x + 40 = 40$

$5x = 0$

$\boxed{x = 0}$

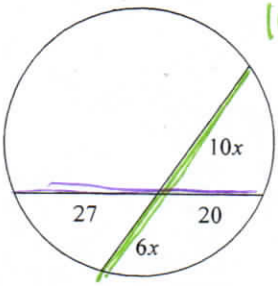
$AH = x + 8$

$= 0 + 8$

$\boxed{AH = 8}$

Solve for x. Assume that lines which appear tangent are tangent.

9)



$10x(6x) = 20(27)$

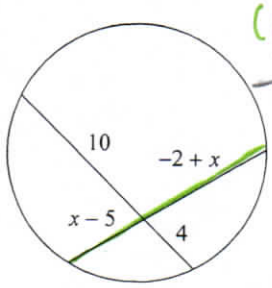
$60x^2 = 540$

$\sqrt{x^2} = \sqrt{9}$

$x = \pm 3$

$\boxed{x = 3}$

10)



$(x-5)(-2+x) = 10(4)$

$-2x + x^2 + 10 - 5x = 40$

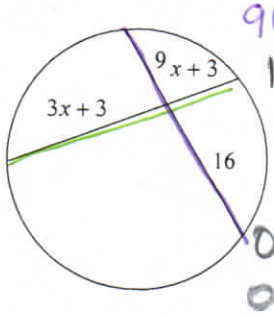
$x^2 - 7x + 10 = 40$

$x^2 - 7x - 30 = 0$

$(x-10)(x+3) = 0$

$\boxed{x = 10}$ $x = -3$

11)



$9(16) = (3x+3)(x+3)$

$144 = 3x^2 + 9x + 3x + 9$

$144 = 3x^2 + 12x + 9$

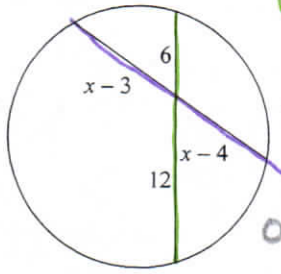
$0 = 3x^2 + 12x - 135$

$0 = 3(x^2 + 4x - 45)$

$0 = 3(x+9)(x-5)$

$x = -9$ $\boxed{x = 5}$

12)



$6(12) = (x-3)(x-4)$

$72 = x^2 - 4x - 3x + 12$

$72 = x^2 - 7x + 12$

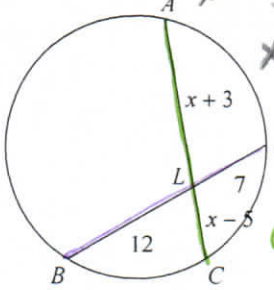
$0 = x^2 - 7x - 60$

$0 = (x-12)(x+5)$

$\boxed{x = 12}$ $x = -5$

Find the measure of the line segment indicated. Assume that lines which appear tangent are tangent.

13) Find CA



$(x+3)(x-5) = 10(7)$

$x^2 - 5x + 3x - 15 = 84$

$x^2 - 2x - 99 = 0$

$(x-11)(x+9) = 0$

$\boxed{x = 11}$ $x = -9$

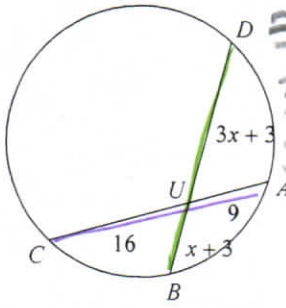
$CA = x + 3 + x - 5$

$= 11 + 3 + 11 - 5$

$= 14 + 6$

$\boxed{CA = 20}$

14) Find UD



$(x+3)(3x+3) = 16(9)$

$3x^2 + 3x + 9x + 9 = 144$

$3x^2 + 12x + 9 = 144$

$3x^2 + 12x - 135 = 0$

$3(x^2 + 4x - 45) = 0$

$3(x+9)(x-5) = 0$

$x = -9$ $\boxed{x = 5}$

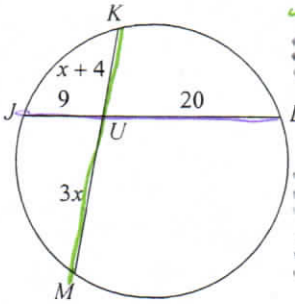
$UD = 3x + 3$

$= 3(5) + 3$

$= 15 + 3$

$\boxed{UD = 18}$

15) Find UM



$3x(x+4) = 9(20)$

$3x^2 + 12x = 180$

$3x^2 + 12x - 180 = 0$

$3(x^2 + 4x - 60) = 0$

$3(x+10)(x-6) = 0$

$x = -10$ $\boxed{x = 6}$

$UM = 3x$

$= 3(6)$ $\boxed{UM = 18}$