Name:____________________

Date:__________

Chords, Tangents & Secants – Segment Lengths

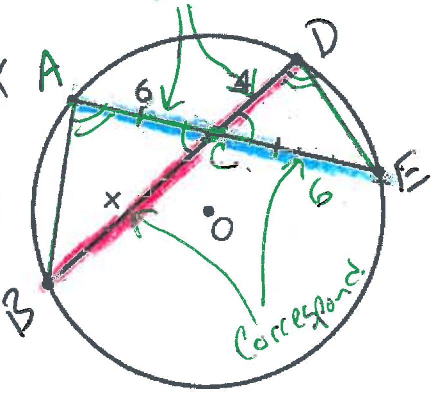
Theorem: If 2 chords intersect **inside** a circle, then the **products of their parts** are =.

1.

(6)(6) = 4x

36 = 4x

x = 9



△ABC ~ △DEC by AA sim.

$$\frac{AC}{DC} = \frac{BC}{EC}$$

(AC)(EC) = (BC)(DC)

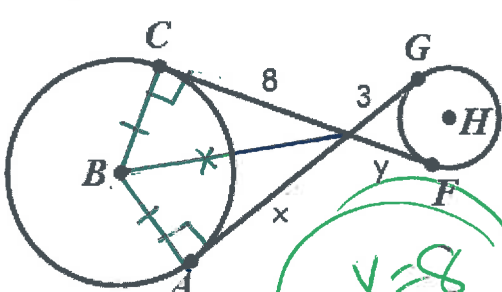
(part)(part) = (part)(part)

same chord. same chord.

Theorem: If 2 tangents intersect **outside** a circle, then they are **congruent**.

This is often called the Ice Cream Cone Theorem.

2. Tangents $\overline{CF}$ & $\overline{AG}$

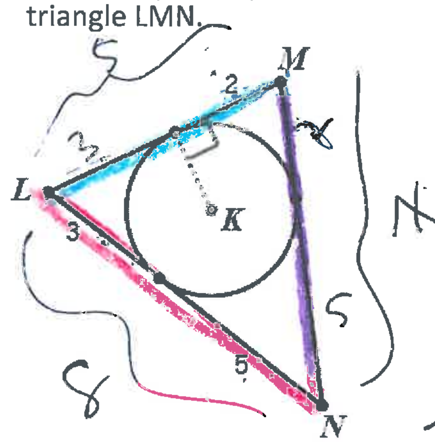


x = 8

y = 3

note: ≅ △'s by HL. ≅ tangents by CPCTC.

3. Tangents $\overline{LM}, \overline{MN}, \overline{LN}$. Find the perimeter of triangle LMN.



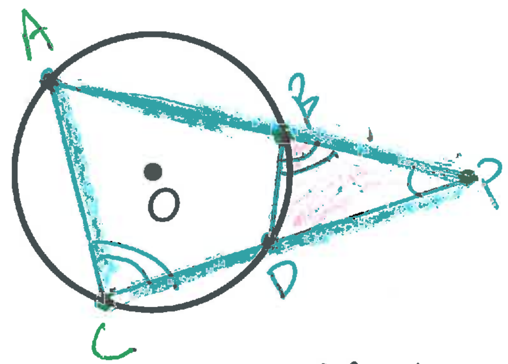
perim = 5 + 7 + 8

= 20

Theorem: If two secants or one secant and one tangent intersect **outside** a circle then:

(Full Segment)(Outside part) = (Full Segment)(Outside part)

Case 1: Secant-Secant:

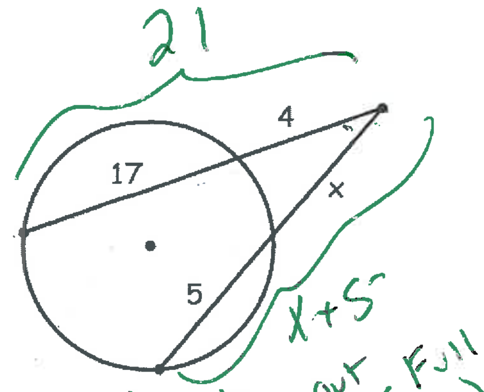


$\triangle ACP \sim \triangle DBP$ by AA sim

$\frac{AP}{DP} = \frac{CP}{BP} \Rightarrow (AP)(BP) = (DP)(CP)$

(Full) (out) (out)(Full)

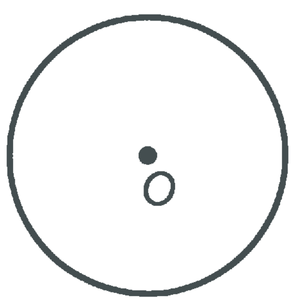
4.



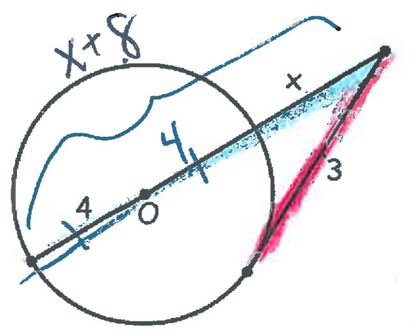
Full out out Full

$(21)(4) = x(x+5)$

Case 2: Secant-Tangent:



5.



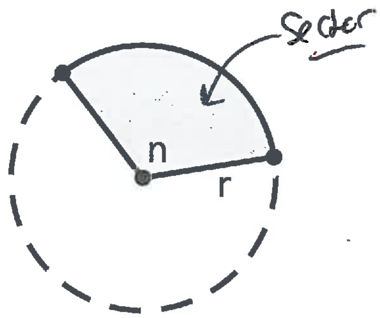
(Full)(out) = (Full)(out)

$(x+8)(x) = (3)(3)$

Area of Circles & Sectors:

Area of a Circle: $A = \pi r^2$

Area of a Sector (fraction of a circle)

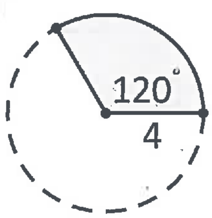


n = measure of the central angle

n in Degrees	n in Radians
$A = \frac{n}{360} \pi r^2$	$A = \frac{n}{2\pi} \pi r^2$
Desired Fraction; area of full Circle	Desired Fraction; area of full Circle

6. Find the area of the sector with the given radius and central angle. Give your answer both in terms of π and rounded to the nearest tenth.

a.

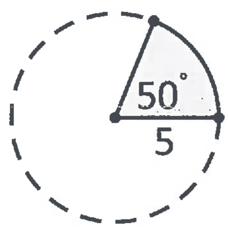


$A = \frac{120}{360} \cdot \pi (4)^2$

$= \frac{1}{3} \cdot 16\pi = \frac{16}{3}\pi$

≈ 16.8 sq. units.

b.



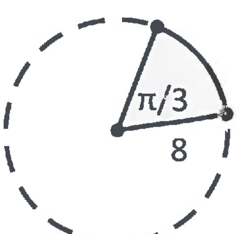
$A = \frac{50}{360} \pi (5)^2$

$= \frac{5}{36} \cdot 25\pi$

$= \frac{125}{36}\pi$

≈ 10.9 sq. units

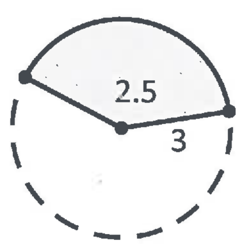
c.



$A = \frac{\pi/3}{2\pi} \cdot \pi (8)^2$

$= \frac{\pi}{3(2\pi)} \cdot \pi (8)^2 = \frac{1}{6}\pi(64) \approx 33.5$ sq. units.

d.



$A = \frac{2.5}{2\pi} \cdot \pi (3^2)$

$= \frac{2.5}{2} \cdot 9$

$= 11.25$ sq. units