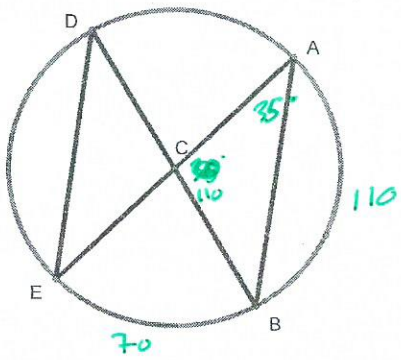
Unit 3 Circles Review

Angles in Circles

Write the formulas

- Central Angles: $m\angle = m\overset{\frown}{arc}$
- Inscribed Angles: $m\angle = \frac{m\overset{\frown}{arc}}{2}$ or $m\overset{\frown}{arc} = m\angle \cdot 2$
- Angles Inside the Circle: (not in the center) $m\angle = \frac{(B\overset{\frown}{arc} + L\overset{\frown}{arc})}{2}$
- Angles Outside the Circle: $m\angle = \frac{(B\overset{\frown}{arc} - L\overset{\frown}{arc})}{2}$

1. In the circle below, C is the center, $m\angle CAB = 35^\circ$ and $m\angle ACB = 110^\circ$. Find the following measures.



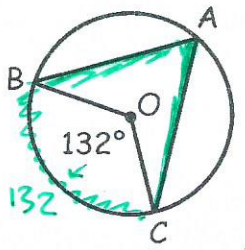
Central $m\overset{\frown}{AB} =$ $m\angle = m\overset{\frown}{arc} \Rightarrow 110^\circ$

inscribed $m\overset{\frown}{EB} =$ $m\overset{\frown}{arc} = m\angle \cdot 2$ $\overset{\frown}{EB} = 35 \cdot 2 \rightarrow \overset{\frown}{EB} = 7$

$m\overset{\frown}{EDB} =$ $360^\circ - 70 = 290^\circ$

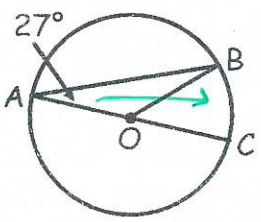
inscribed $m\angle EDB =$ $\frac{m\angle}{2} = \frac{m\overset{\frown}{arc}}{2}$ $\angle EDB = \frac{70}{2} \rightarrow \angle EDB = 35$

Find the measure of the indicated angle or arc.



$m\angle = \frac{132}{2}$

2) $m\angle BAC =$ 66°



$m\angle = \frac{m\overset{\frown}{arc}}{2}$

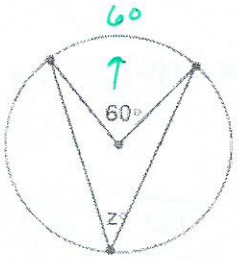
2. $27 = \frac{arc}{2}$

3) $m\overset{\frown}{BC} =$ 54°

$m\angle = \frac{arc}{2}$

$z = \frac{60}{2}$

$z = 30$

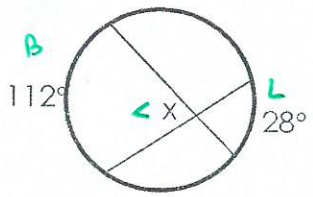


4) z = 30°

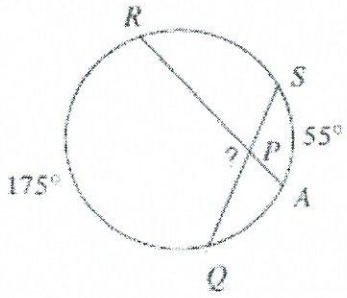
$m\angle = \frac{B + L}{2}$

$x = \frac{(112 + 28)}{2}$

$x = \frac{140}{2}$



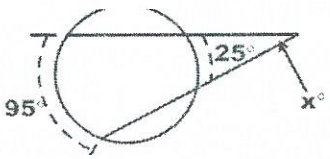
5) x = 70°



$m\angle = \frac{175+55}{2}$

$m\angle = \frac{230}{2}$

6) $m\angle P =$ 115°

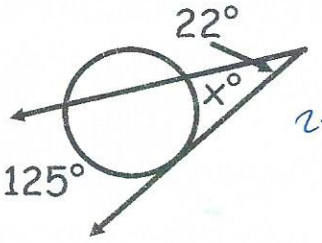


$m\angle = \frac{B-L}{2}$

$m\angle = \frac{95-25}{2}$

$m\angle = \frac{70}{2}$

7) x = 35°



$m\angle = \frac{B-L}{2}$

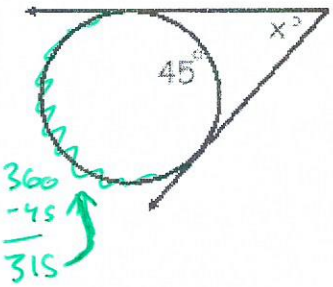
$2 \cdot 22 = \frac{125-x}{2} \cdot 2$

$44 = 125 - x$

$-125 \quad -125$

$-81 = -x$

8) x = 81°



$m\angle = \frac{B-L}{2}$

$x = \frac{315-45}{2}$

$x = \frac{270}{2}$

9) x = 135°

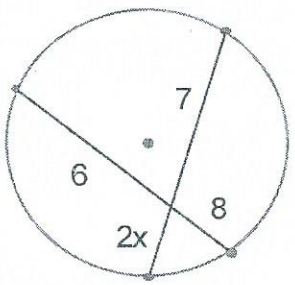
Segment Lengths in Circles

Write the formulas:

- Chords that intersect inside: (Part)(Part) = (Part)(Part) * Parts must be on same line
- Secants that intersect outside: (Outside)(whole) = (outside)(whole) * whole = outside + inside
- Secant and Tangent that intersect outside: $(\text{tan})^2 = (\text{out})(\text{whole})$

Find the indicated measure.

10) Find x.

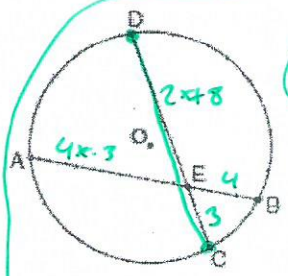


$(7)(2x) = (6)(8)$

$\frac{14x}{14} = \frac{48}{14}$

$x = 3.4$

11) $DE = 2x + 8$, $EC = 3$, $AE = 4x - 3$, and $EB = 4$. Find $m\overline{CD}$.



$(3)(2x+8) = (4)(4x-3)$

$6x + 24 = 16x - 12$

$-6x \quad +12 \quad -6x \quad +12$

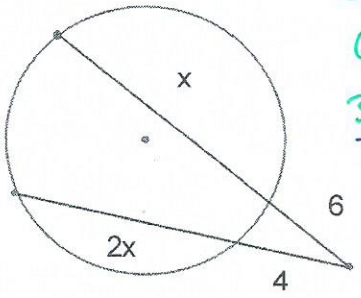
$\frac{36}{10} = \frac{10x}{10}$

$3.6 = x$

$3 + 2(3.6) + 8$

18.2

12) Find x.



out(whole) = out(whole)

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

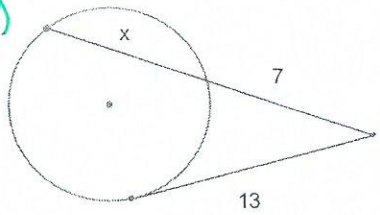
$36 + 6x = 16 + 8x$

$-16 \quad -6x \qquad -16 \quad -6x$

$\frac{20}{2} = \frac{2x}{2}$

$10 = x$

13) Find x.



$7(7+x) = (13)^2$

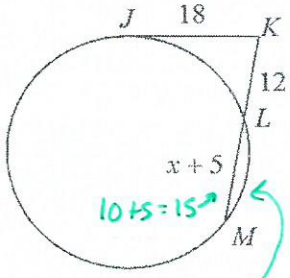
$49 + 7x = 169$

$-49 \qquad -49$

$\frac{7x}{7} = \frac{120}{7}$

$x = 17.1$

14) Find the $m\overline{KM}$.



$(18)^2 = 12(12+x+5)$

$(18)^2 = 12(17+x)$

$324 = 204 + 12x$

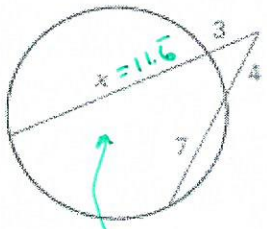
$-204 \quad -204$

$\frac{120}{12} = \frac{12x}{12}$

$x = 10$

$KM = 12+15 = 27$

15. Find the length of the top secant.



$3(3+x) = 4(11)$

$9 + 3x = 44$

$-9 \qquad -9$

$\frac{3x}{3} = \frac{35}{3}$

$x = 11.6̄$

$3 + 11.6̄ = 14.6̄$

Arc Length and Sector Area

Write the formulas:

Circumference: $C = 2\pi r$ or $C = \pi D$

Area: $A = \pi r^2$

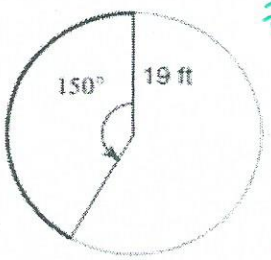
Arc Length: $\frac{\text{arc}}{360} \cdot 2\pi r$ or $\frac{\text{arc}}{360} \cdot \pi d$

Sector Area: $\frac{\text{arc}}{360} \cdot \pi r^2$

* Remember you can use a fraction instead of degree

Find the arc length and sector area of the following.

16.



$\frac{150}{360} \cdot 2\pi 19 = 15\pi$ ft $\rightarrow 47.12$ ft

Arc Length: _____

$\frac{150}{360} \cdot \pi 19^2 = \frac{1805\pi}{12}$ ft^2 $\rightarrow 472.55$ ft^2

Sector Area: 472.55 ft^2

17. central angle of 85° and a diameter of 5 cm.

~~$d = 5 \rightarrow r =$~~

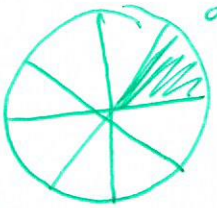
$d = 5 \rightarrow r = 2.5$

Arc Length: 3.7 cm

$\frac{85}{360} \cdot 2\pi 2.5$

Sector Area: 4.67 cm^2 $\frac{85}{360} \cdot \pi 2.5^2$

18. The diameter of a pie is 10 in. The pie is cut into 8 slices. What is the arc length of each slice?



$C = \pi \cdot 10$

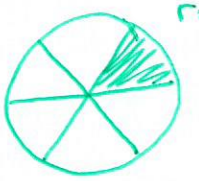
fraction I want $= \frac{1}{8}$

$AL = \frac{\text{marc}}{360} \cdot \pi \cdot d$

$\frac{1}{8} \cdot \pi \cdot 10 =$

$\frac{5\pi}{4} = 3.93 \text{ in}$

19. An Apple pie has a radius of 4.5in. The pie is cut into 6 equal pieces. What is the area of each piece of the pie?



fraction $= \frac{1}{6}$

$SA = \frac{\text{marc}}{360} \cdot \pi r^2$

$\frac{1}{6} \cdot \pi \cdot 2.5^2 = \frac{25\pi}{24} = 3.2$

20. A sprinkler has a circular path that sprays 20 ft (the radius of the circle). If the sprinkler is set to a quarter turn, what is the area of the yard that will be watered?

$r = 20$

fraction $= \frac{1}{4}$

area $\rightarrow \frac{\text{marc}}{360} \cdot \pi \cdot r^2$

$\frac{1}{4} \cdot \pi \cdot 20^2 = 100\pi \rightarrow 314.16 \text{ft}^2$

21. The radius of a bike wheel is 12 inches. There are 9 spokes on the wheel. What is the length between each spoke?

fraction $= \frac{1}{9}$

$AL = \frac{\text{marc}}{360} \cdot 2\pi r$

$\frac{1}{9} \cdot 2\pi 12 = \frac{8\pi}{3} \rightarrow 8.38 \text{ in}$

22. There are two pies each with a diameter of 12 in. One pie is cut into 6 slices. The other is cut into 10 slices. How much more pie do you get from a slice of the first pie?

Pie 1

Pie 2

$SA = \frac{\text{marc}}{360} \pi r^2$

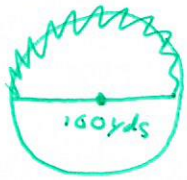
Pie 1 $\rightarrow \frac{1}{6} \cdot \pi \cdot 6^2 = 6\pi \rightarrow 18.85 \text{ in}^2$

Pie 2 $\frac{1}{10} \cdot \pi \cdot 6^2 = \frac{18\pi}{5} \rightarrow 11.31 \text{ in}^2$

subtract

you get 7.54 in^2 more Pie

23. A circular track has a diameter of 100 yards. A track athlete sprints around half the track. How far did the athlete sprint?



$d = 100$

fraction $= 1/2$

$AL = \frac{\text{marc}}{360} \cdot 2\pi \cdot d$

$\frac{1}{2} \cdot \pi \cdot 100 = 50\pi \rightarrow 157.08 \text{ yd}$

24. The Cheesecake Factory has two different sizes of cheesecake. A small cheesecake has a diameter of 8 inches and is cut into 8 slices. A large cheesecake has a diameter of 12 inches and is cut into 12 slices. Which option would give you more cheesecake; purchasing three slices of the ~~medium~~ small cheesecake or two slices of the large cheesecake?

sm

fraction $= \frac{3}{8}$

fraction $= \frac{2}{12}$

$\frac{3}{8} \cdot \pi \cdot 4^2 = 6\pi \rightarrow 18.85 \text{ in}^2$

small $=$ big

$\frac{2}{12} \cdot \pi \cdot 6^2 = 6\pi \rightarrow 18.85 \text{ in}^2$

both will give the same amount.