

* This page has a lot of edits, fix accordingly

9.3: Circumscribed Angles, Arc Length, and Sector Area

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|--|--|
| <p>Tangent: Line that intersects the circle once (edge) ex: RT</p> | |
| <p>Point of Tangency Secant: Line that intersects the circle twice</p> | |

| | | | |
|---|-----------------------|---|--------------------|
| <p>Two Tangents</p> <p>* Two arcs add to 360°</p> | <p>Tangent-Secant</p> | <p>Relationship</p> $\text{Angle} = \frac{\text{Big arc} - \text{little arc}}{2}$ | <p>Two Secants</p> |
|---|-----------------------|---|--------------------|

1) Find the measure of the angle or arc indicated.

a)

$$360 - 235 = 125$$

$$x = \frac{235 - 125}{2}$$

$$x = \frac{110}{2} = \boxed{55}$$

* Two tangents

b)

$$2 \cdot 51 = \frac{180 - x}{2} \cdot 2$$

$$102 = 180 - x$$

$$-180 + 180$$

$$-78 = -x$$

$$\boxed{78} = x$$

c)

$$2 \cdot 40 = \frac{x - 61}{2} \cdot 2$$

$$80 = x - 61$$

$$+61 \quad +61$$

$$\boxed{141} = x$$

d)

$$2(5x+5) = \frac{148 - (8x-6)}{2} \cdot 2$$

$$10x + 10 = 148 - 8x + 6$$

$$10x + 10 = 154 - 8x$$

$$+8x \quad -10 \quad -10 \quad +8x$$

$$18x = 144$$

$$\frac{18x}{18} = \frac{144}{18} \quad \boxed{x=8}$$

Solve for x.

Be sure to subtract with parentheses.

e)

Solve for x.

$$360 - 226 = 134$$

$$6x + 4 = \frac{226 - 134}{2}$$

$$6x + 4 = \frac{92}{2}$$

$$6x + 4 = 46$$

$$-4 \quad -4$$

$$6x = 42$$

$$\boxed{x=7}$$

* Two tangents

f)

Find RT

$$2(25x+5) = \frac{118x-1 - (5+60x)}{2} \cdot 2$$

$$50x + 10 = 118x - 1 - 5 - 60x$$

$$50x + 10 = 58x - 6$$

$$-50x + 6 \quad -50x + 6$$

$$\frac{16}{2} = \frac{8x}{2} \quad x=2$$

$$m\widehat{RT} = 5 + 60(2)$$

$$= 5 + 120$$

$$= \boxed{125}$$

Circumference:

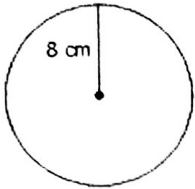
$$2\pi r$$

Area:

$$\pi r^2$$

2) Find the circumference of the circle. List your answer in both exact form (using π in your answer) and approximate form.

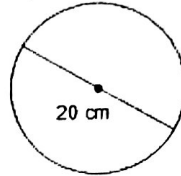
a)



$$2\pi(8)$$

Exact: 16π cm
Approx: 50.27 cm

b)



c) Find C if $r = 7$

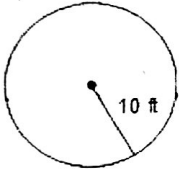
Exact: Type everything except π into calculator

d) Find d and r to the nearest hundredth if $C = 136.9$

Approximate: Type everything into calculator, including π

3) Find the area of the circle. List your answer in both exact form and approximate form.

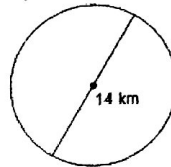
a)



$$\pi(10)^2$$

Exact: 100π ft²
Approx: 314.16 ft²

b)

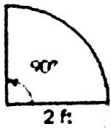


Find A if $d = 15$

d) Find A if $C = 14.9$

4) Consider the following circles:

a.



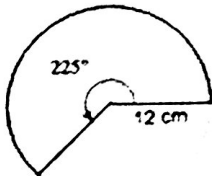
What portion of the circle are you supposed to be using solving for?

$$\frac{1}{4}$$

How did you get that?

$$\frac{90}{360}$$

b.



Now what portion of the circle are you supposed to be solving for?

$$\frac{5}{8}$$

How did you get that?

$$\frac{225}{360}$$

part
whole

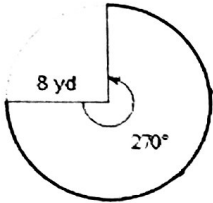
Fraction of Circumference

Fraction of Area

| Arc Length | Sector Area |
|------------------------------|-------------------------------|
| $\frac{N}{360} \cdot 2\pi r$ | $\frac{N}{360} \cdot \pi r^2$ |

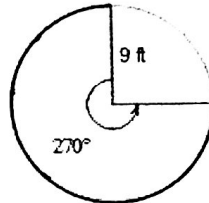
5) Find the arc length and sector area for each of the following:

a)



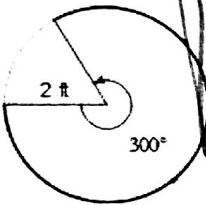
Arc Length
 $\frac{270}{360} \cdot 2\pi(8)$
 Exact: 12π yd
 Approx: 37.70 yd

b)

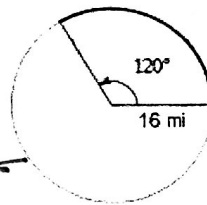


Sector Area
 $\frac{270}{360} \cdot \pi(8)^2$
 Exact: 48π yd²
 Approx: 150.80 yd²

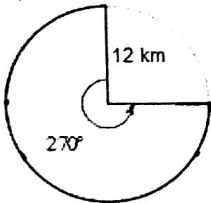
c)



d)



e)



f)

