CORNELL NOTES

TOPIC/OBJECTIVE: Circle

CONTENT/CLASS: Geometry

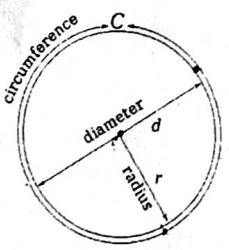
NAME:

CLASS/PERIOD:

DATE:

ESSENTIAL QUESTION: How can you find the area and circumference of a portion of a circle?

QUESTIONS:



r = radius - distance from the center to the edge

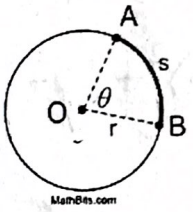
d = diameter - distance from one end of the circle through the center to the opposite end

Circumference - distance around the circle

$C = \pi d$ or $C = 2\pi r$

Area of a Circle = πr^2

Sector = section of a circle (slice)

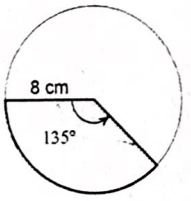


Central Angle = theta θ angle whose vertex is the center of cir

Arc = portion of circumference (crust)

Area of a Sector = $\frac{\theta}{360} \pi r^2$

Example



$A = \frac{135}{360} \pi 8^2$

$= \frac{135}{360} \cdot 64 \cdot \pi$

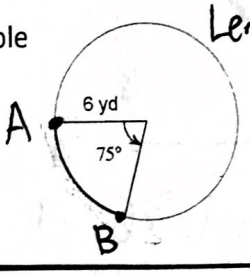
$= 24\pi \text{ cm}^2 \approx 75.40$

Length of Arc $\overset{\frown}{AB}$ = $\frac{\theta}{360} \cdot 2\pi r$

Or

~~Length of Arc AB~~ = _____

Example



Length of $\overset{\frown}{AB} = \frac{75}{360} \cdot 2 \cdot \pi \cdot 6$

$= \frac{75}{360} \cdot 12 \cdot \pi$

$= 2.5\pi \text{ yd} \approx 7.85$

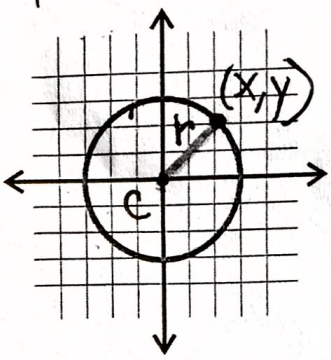
SUMMARY:

QUESTIONS:

NOTES:

The Equation of a Circle

Circle: Set of points in a plane that are equidistant from a given point. The given point is called the center of a circle



Given : Circle C

Let (h,k) be the center of circle C.

Let (x, y) be any point on the circle

Let *r* = the radius of circle C

The **standard form** or **center-radius form** equation of a circle:

$$(x-h)^2+(y-k)^2=r^2$$

Where **(h, k) is the center** and **r is the radius.**

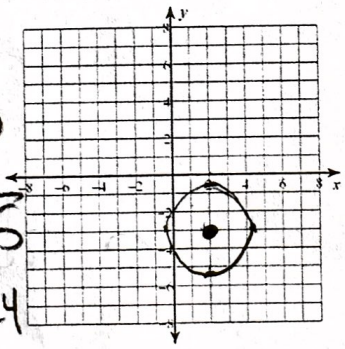
h k r

Example 1. Write an equation with the center of (13, -12) and radius of 4 :

$(x-13)^2+(y+12)^2=16$

Examples of graphing equations

$(x-2)^2+(y+3)^2=5$

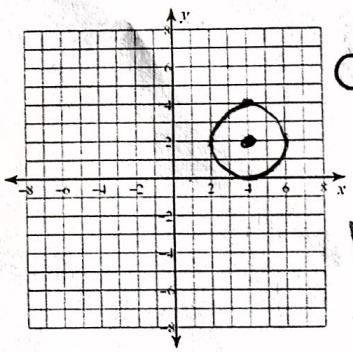


center (2, -3)

radius $=\sqrt{5}$

≈ 2.24

$(x-4)^2+(y-2)^2=4$



center (4, 2)

radius = 2

Completing the Square Example Problem

Complete the square to find the center and the radius of the circle.

$$\frac{4x^2+4y^2-16x+24y-36}{4}=\frac{0}{4}$$

$x^2+y^2-4x+6y-9=0$

$x^2-4x \quad y^2+6y=9$

$(x^2-4x+\underline{4})+(y^2+6y+\underline{9})=9+4+9$

$\frac{1}{2}(-4)=-2$ $\quad (-2)^2=4$

$\frac{1}{2}(6)=3$ $\quad 3^2=9$

$(x-2)^2+(y+3)^2=22$

center (2, -3) radius $=\sqrt{22}$