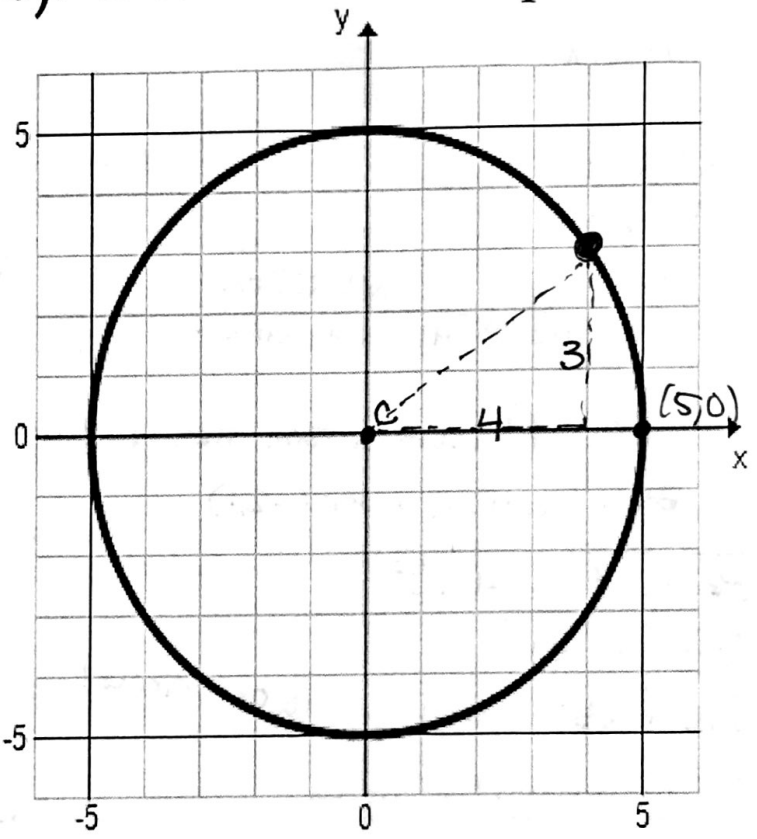
Formulas

Circumference: $C = 2\pi r$ or $C = 2 \cdot \pi \cdot r$ (Distance around the entire circle)

Area: $A = \pi r^2$ or $\pi \cdot r^2$ (amount of squares that fit inside)

Ex. 1: Given this circle with the center at the origin and a point on the circle at **(5,0)**. Determine if the points are on the circle.



A. Identify the radius:

radius = 5 units

B. $(4,3)$

$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$\sqrt{25} = \sqrt{c^2}$

$5 = c$

Yes, the point is 5 away from the center.

C. $\left(2, \sqrt{19}\right)$ center: (0,0)

* Find distance this point is from the center.

If it's on the circle, it will be exactly 5 away. <5 inside the circle >5 outside the circle

$\sqrt{(2-0)^2 + (\sqrt{19}-0)^2} = \sqrt{2^2 + (\sqrt{19})^2} = \sqrt{4+19} = \sqrt{23} \approx 4.79.$

The point is NOT on the circle. It's inside.

D. Circumference

$C = 2 \cdot \pi \cdot r$

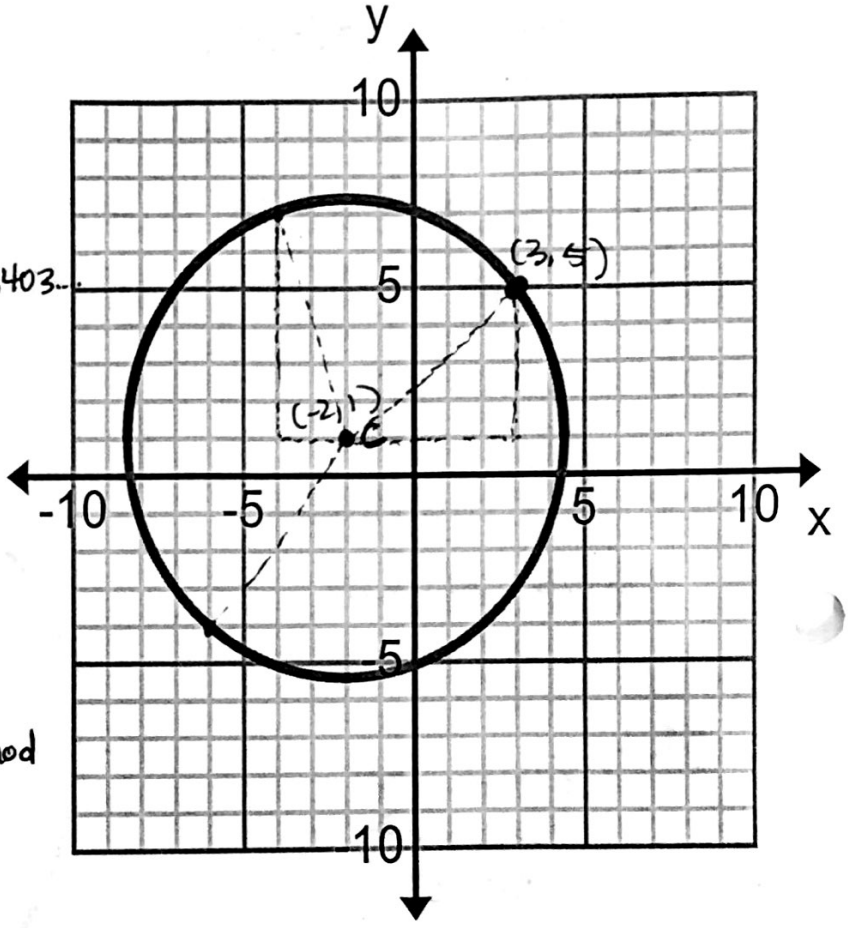
$C = 2 \cdot \pi \cdot (5) = 10\pi \approx 31.42$ units

E. Area

$A = \pi r^2$

$\pi(5)^2 = 25\pi = 78.54$ units^2

Ex. 2: Given this circle with the center at $(-2,1)$ and a point on the circle at $(3,5)$. Determine if the point are on the circle.



A. Identify the radius:

- Distance from $(-2,1)$ to $(3,5)$
- use Distance Formula or Pyth. Thm.

$5^2+4^2=c^2$
$25+16=c^2$
$41=c^2$ $r=\sqrt{41}\approx 6.403...$

B. (AAA?)$(-4,7)$

$2^2+6^2=c^2$
$4+36=c^2$
$40=c^2$
$c=\sqrt{40}\neq\sqrt{41}$ NO. NOT on the circle.

C. $(-6,-4)$ Distance Form. Method

Distance Btwn $(-6,-4)$ & center $(-2,1)$

$\sqrt{(-6--2)^2+(-4-1)^2}$
$\sqrt{(-4)^2+(-5)^2}$
$\sqrt{16+25}=\sqrt{41}$ ✓ is on circle!

D. Circumference

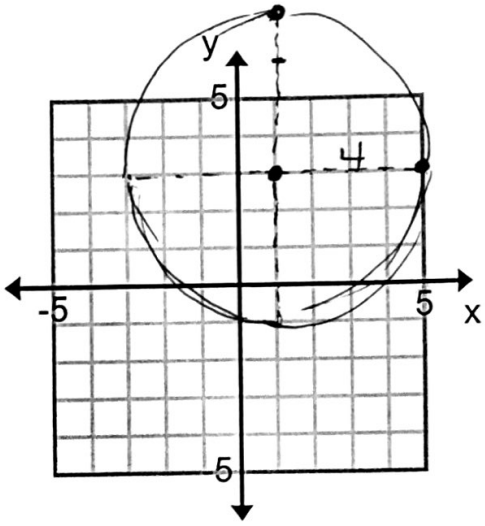
radius $=\sqrt{41}$

$C=2\pi r$
$C=2\pi(\sqrt{41})=$ 40.23 units

E. Area

$A=\pi r^2$
$A=\pi(\sqrt{41})^2$
$A=\pi\cdot 41=$ 128.81 units^2

Ex. 3: Given a circle with the center at $(1,3)$ and a point of $(5,3)$ on the circle. Determine if the following points are on the circle.



center (1,3)

A. $(0,-1)$

is this point 4 from the center? (1,3)

$\sqrt{(0-1)^2+(-1-3)^2}$

$\sqrt{(-1)^2+(-4)^2}$

$\sqrt{1+16}$

$\sqrt{17} \neq 4$

NOT on the circle.

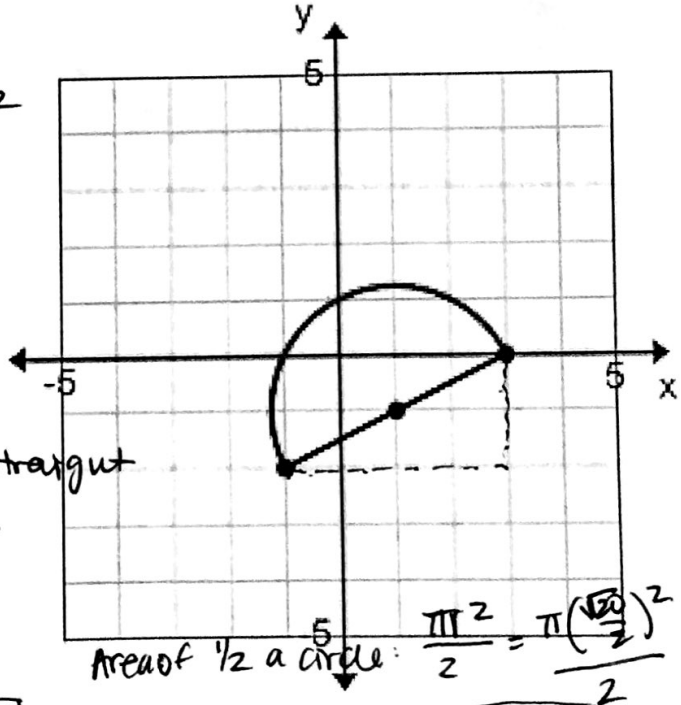
B. $(1,7)$

$\sqrt{(1-1)^2}$

yes it's 4 up from the center.

Ex. 4: Find the perimeter and area of the figure.

- Find straight piece
- Find whole circumference then cut in 1/2
- ↳ Add together!



Straight Piece: $4^2+2^2=c^2$

$16+4=c^2$

$20=c^2$

$\sqrt{20}=c$ $\quad c \approx 4.47$

Circumference $= 2\cdot\pi\cdot r$

radius = 1/2 the straight piece

so, $r = 2.235$

$2\cdot\pi\cdot\left(\frac{\sqrt{20}}{2}\right) = 14.04$

But only want half's $= 7.02$

Area of 1/2 a circle: $\frac{\pi r^2}{2} = \frac{\pi\left(\frac{\sqrt{20}}{2}\right)^2}{2} = 7.85 \text{ units}^2$

Total: $\cap + \_ = 7.02 + 4.47 = 11.49$ units