Analytic Geometry

Name_____ ID: 1

Circles Test Review

Date_____ Period____

Use the information provided to write the equation of each circle in STANDARD FORM

1) Center: $(0, 0)$
Radius: $7\sqrt{7}$

$x^2+y^2=343$

2) Center: $(-7, 4)$
Radius: 6

$(x+7)^2+(y-4)^2=36$

3) Center: $(6, -11)$
Area: 9π

$9\pi=\pi r^2$

$r=3$

$(x-6)^2+(y+11)^2=9$

4) Center: $(-8, -2)$
Area: 25π

$25\pi=\pi r^2$

$r=5$

$(x+8)^2+(y+2)^2=25$

5) Center: $(14, 8)$
Circumference: 4π

$4\pi=2\pi r$

$r=2$

$(x-14)^2+(y+8)^2=4$

6) Center: $\left(\sqrt{182}, \frac{31}{2}\right)$
Circumference: 6π

$6\pi=2\pi r$

$r=3$

$(x-\sqrt{182})^2+(y-\frac{31}{2})^2=9$

7) Center: $(3, 10)$
Point on Circle: $(2, 3)$

$r = \sqrt{(2-3)^2+(3-10)^2}$
$= \sqrt{1+49} = \sqrt{50}$

$(x-3)^2+(y-10)^2=50$

8) Center: $(-6, -15)$
Point on Circle: $(-8, -14)$

$r = \sqrt{(-8--6)^2+(-14--15)^2}$
$= \sqrt{4+1} = \sqrt{5}$

$(x+6)^2+(y+15)^2=5$

9) Ends of a diameter: $(13, 10)$ and $(1, -10)$

Center: $\left(\frac{13+1}{2}, \frac{10+-10}{2}\right)$
$= (7, 0)$

$r = \sqrt{(7-13)^2+(0-10)^2}$
$= \sqrt{36+100} = \sqrt{136}$

$(x-7)^2+y^2=136$

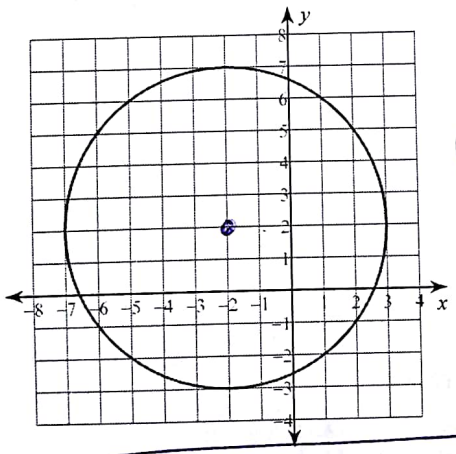
10) Ends of a diameter: $(-6, -5)$ and $(-14, -3)$

Center: $\left(\frac{-6+-14}{2}, \frac{-5+-3}{2}\right)$
$= (-10, -4)$

$r = \sqrt{(-10--6)^2+(-4--5)^2}$
$= \sqrt{16+1} = \sqrt{17}$

$(x+10)^2+(y+4)^2=17$

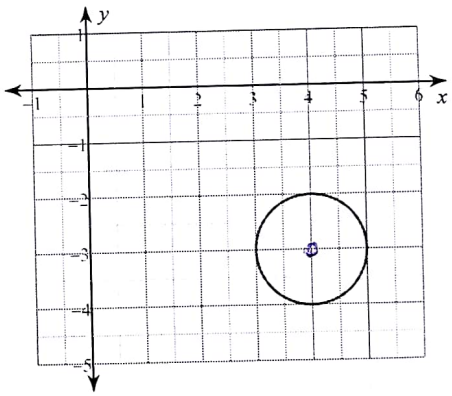
11)



C: $(-2, 2)$
$r = 5$

$(x+2)^2+(y-2)^2=25$

12)



C: $(4, -3)$
$r = 1$

$(x-4)^2+(y+3)^2=1$

Use the information provided to write the equation of each circle in GENERAL FORM

13) Center: $(-2, 9)$
Radius: 7

$(x+2)^2+(y-9)^2=49$

$(x+2)(x+2)\quad(y-9)(y-9)$

$x^2+2x+2x+4+y^2-9y-9y+81=49$

$x^2+y^2+4x-18y+36=0$

14) Center: $(-10, 15)$
Radius: $\sqrt{11}$

$(x+10)^2+(y-15)^2=11$

$(x+10)(x+10)\quad(y-15)(y-15)$

$x^2+10x+10x+100+y^2-15y-15y+225=11$

$x^2+y^2+20x-30y+314=0$

Use the information provided to write the equation of each circle.

15) Ends of a diameter: $(13, -9)$ and $(-17, 1)$

A) $(x+3)^2+(y-3)^2=250$
B) $(x+2)^2+(y+4)^2=62500$
C) $(x+2)^2+(y+4)^2=250$
D) $(x-4)^2+(y-2)^2=250$

Center: $\left(\frac{13+-17}{2}, \frac{-9+1}{2}\right)$

$:(-2,-4)$

$r=\sqrt{(-2-13)^2+(-4--9)^2}$

$=\sqrt{225+25}$

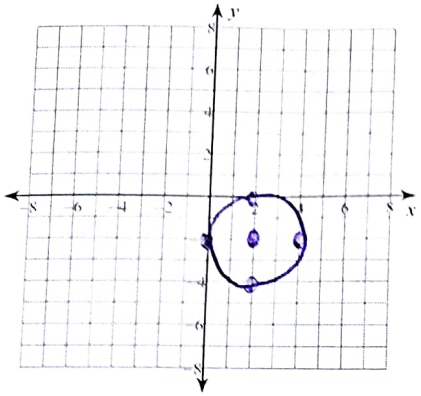
$=\sqrt{250}$

16) Center: $(11, -13)$
Point on Circle: $(9, -15)$

A) $(x-13)^2+(y-10)^2=8$
B) $(x-13)^2+(y-11)^2=8$
C) $(x-11)^2+(y+13)^2=8$
D) $(x+13)^2+(y+11)^2=8$

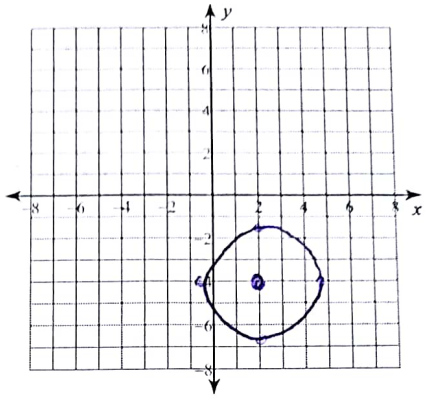
Identify the center and radius of each. Then sketch the graph.

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



C: (2, -2) r = 2

18) $(x-2)^2+(y+4)^2=8$



C: (2, -4) $r=\sqrt{8}=2\sqrt{2}$

$=2.8$

Use the information provided to write the standard form equation of each circle. Tell the center and the radius.

19) $x^2+y^2+2x-18y+66=0$

$x^2+2x+\underline{1}+y^2-18y+\underline{81}=-66+\underline{1}+\underline{81}$

$(2/2)^2=1^2=1 \quad (-18/2)^2=(-9)^2=81$

$(x+1)^2+(y-9)^2=16$

C: (-1, 9)
r = 4

20) $x^2-8x-6y=-y^2+11$

$x^2-8x+\underline{16}+y^2-6y+\underline{9}=11+\underline{16}+\underline{9}$

$(-8/2)^2=(-4)^2=16 \quad (\frac{-6}{2})^2=(-3)^2=9$

$(x-4)^2+(y-3)^2=36$

C: (4, 3)
r = 6

Prove whether the given point lies on, inside, or outside of the circle.

21) Center: origin, containing point (-5, 0)
Pt (2, 5)

(0,0)

$r = \sqrt{(-5-0)^2+(0-0)^2}$

$= \sqrt{25+0} = \sqrt{25} = 5$

$x^2+y^2=25$

$(2)^2+(5)^2=25$

$29>25$

outside

22) Center: origin, containing point (0, 8)
Pt $(1,\sqrt{7})$

(0,0)

$r = \sqrt{(0-0)^2+(0-8)^2}$

$= \sqrt{0+64} = \sqrt{64} = 8$

$x^2+y^2=64$

$1^2+\sqrt{7}^2=64$

$8<64$

inside

23) The point (3,1) lies on a circle whose equation is $(x-8)^2+(y-1)^2=r^2$. Which of the following must be the radius of the circle?

A) $\sqrt{5}$ B) 10 C) 25 **D) 5**

$(3-8)^2+(1-1)^2$

$25+0=25$

$r^2=25$

$r=5$

24) The point (-12,-6) lies on a circle whose equation is $(x+5)^2+(y+3)^2=r^2$. Which of the following must be the radius of the circle?

A) $\sqrt{26}$ B) 26
C) $\sqrt{58}$ D) 58

$(-12+5)^2+(-6+3)^2$

$49+9=58$

$r^2=58$

$r=\sqrt{58}$

25) Given the following equation of a circle $(x+2)^2+(y+2)^2=9$ determine if the following points are in, on or outside the circle. Show all of your work and explain each answer.

(-2,-2)	(2,1)	(-3,-4)	(-2,1)
in	out	in	on
$(-2+2)^2+(-2+2)^2$	$(2+2)^2+(1+2)^2$	$(-3+2)^2+(-4+2)^2$	$(-2+2)^2+(1+2)^2$
$0<9$	$25>9$	$5<9$	$9=9$

Identify the center and radius of each.

26) $x^2+y^2-20x-16y+97=0$

A) Center: $(-10,-8)$
Radius: $\sqrt{67}$

B) Center: $(-10, 8)$
Radius: 2

**C) Center: $(10, 8)$
Radius: $\sqrt{67}$**

D) Center: $(6,-12)$
Radius: $\sqrt{67}$

$x^2-20x+100+y^2-16y+64=-97+100+64$

$(x-10)^2+(y-8)^2=67$

27) $x^2+y^2-32x+6y+261=0$

A) Center: $(3,-16)$
Radius: 4

B) Center: $(-16, 3)$
Radius: 4

**C) Center: $(16,-3)$
Radius: 2**

D) Center: $(3, 16)$
Radius: 2

$x^2-32x+256+y^2+6y+9=-261+256+9$

$(x-16)^2+(y+3)^2=4$

28) $x^2 + y^2 - 28x + 32y + 448 = 0$

A) Center: $(14, -16)$
Radius: 2

B) Center: $(-13, 14)$
Radius: 2

C) Center: $(-14, -16)$
Radius: 4

D) Center: $(-14, 16)$
Radius: 2

$x^2 - 28x + \_\_ + y^2 + 32y + \_\_ = -448 + \_\_ + \_\_$

$(x-14)^2 + (y+16)^2 = 4$

29) $x^2 + y^2 - 14x + 14y + 55 = 0$

A) Center: $(-5, 6)$
Radius: $\sqrt{43}$

B) Center: $(-7, -7)$
Radius: 43

C) Center: $(7, -7)$
Radius: $\sqrt{43}$

D) Center: $(-7, -7)$
Radius: $\sqrt{43}$

$x^2 - 14x + \_\_ + y^2 + 14y + \_\_ = -55 + \_\_ + \_\_$

$(x-7)^2 + (y+7)^2 = 43$

30) $(x+9)^2 + \left(y - \frac{13}{2}\right)^2 = 100$

A) Center: $\left(-9, \frac{13}{2}\right)$
Radius: 100

B) Center: $\left(-9, \frac{13}{2}\right)$
Radius: 10

C) Center: $\left(-9, -\frac{13}{2}\right)$
Radius: 100

D) Center: $\left(-\frac{13}{2}, 9\right)$
Radius: 10

31) $(x+16)^2 + (y-8)^2 = 4$

A) Center: $(10, 18)$
Radius: 2

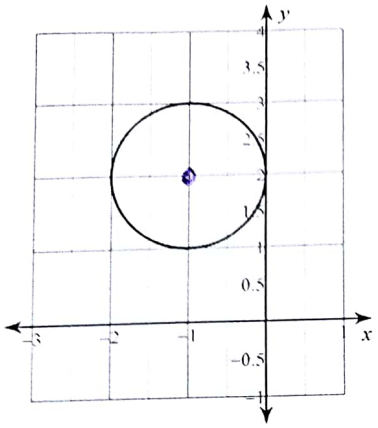
B) Center: $(-7, -16)$
Radius: 2

C) Center: $(17, 10)$
Radius: 2

D) Center: $(-16, 8)$
Radius: 2

Use the information provided to write the general conic form equation of each circle.

32)



A) $x^2 + y^2 + 2x + 4y = 0$

B) $3x^2 + y^2 - 2x - 2y = 0$

C) $x^2 + y^2 + 2x - 4y + 4 = 0$

D) $x^2 + y^2 + 2x + 4y + 3 = 0$

$(x+1)^2 + (y-2)^2 = 1$

$x^2+1x+1x+1+y^2-2y-2y+4=1$

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

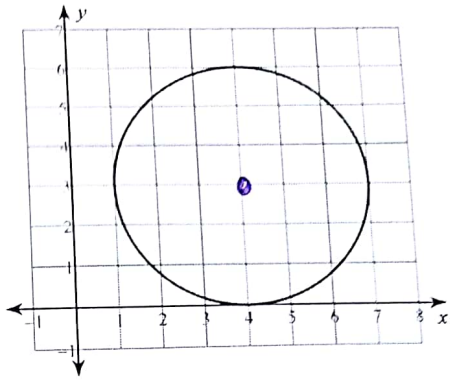
34) $(x+3)^2 + (y+10)^2 = 36$

$(x+3)(x+3)\quad (y+10)(y+10)$

$x^2+3x+3x+9+y^2+10y+10y+100=36$

$x^2+y^2+6x+20y+73=0$

33)



A) $4x^2 - y^2 - 8x - 6y - 14 = 0$

B) $x^2 + y^2 - 8x - 6y - 56 = 0$

C) $x^2 + 2y^2 - 8x - 6y + 16 = 0$

D) $x^2 + y^2 - 8x - 6y + 16 = 0$

$(x-4)^2 + (y-3)^2 = 9$

$x^2-4x-4x+16+y^2-3y-3y+9=9$

$x^2+y^2-8x-6y+16=0$

35) $(x+5)^2 + y^2 = 144$

$(x+5)(x+5)$

$x^2+5x+5x+25+y^2=144$

$x^2+y^2+10x-119=0$