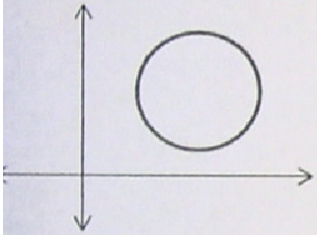
Geometry Honors
Circles in the Coordinate Plane
Notes

Name: _____

Duffy

You can use the distance formula to find the equation of a circle with center (h, k) and radius r.



Equation of a circle with center (h, k) and radius r.

Ex 1: Find the equation of a circle with:

a. radius 5 and center (-5, 3) _____
b. radius $7\sqrt{5}$ and center (0, -1) _____
c. diameter 50 and center ($\sqrt{3}$, -100) _____

Ex 2: Find the center and radius for each circle:

	center	radius
a. $(x-8)^2 + y^2 = 9$		
b. $(x+2)^2 + (y-4)^2 = 7$		
c. $(x-6)^2 + (y+11)^2 = 99$		

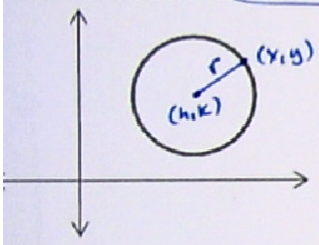
Ex 3: What is the standard form of a circle with center (1, -3) that passes through the point (2, 2)?

Geometry Honors
Circles in the Coordinate Plane
Notes

Name: _____

Duffy

You can use the distance formula to find the equation of a circle with center (h, k) and radius r.



$$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

$$r = \sqrt{(x-h)^2 + (y-k)^2}$$

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

Equation of a circle with center (h, k) and radius r.

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

1: Find the equation of a circle with:

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

a. radius 5 and center (-5, 3) (h, k) $(x-(-5))^2+(y-3)^2=5^2$ $(x+5)^2+(y-3)^2=25$

b. radius $7\sqrt{5}$ and center (0, -1) $(x-0)^2+(y-(-1))^2=(7\sqrt{5})^2$ $x^2+(y+1)^2=245$

c. diameter 50 and center $(\sqrt{3}, -100)$ $r=25$ $(x-\sqrt{3})^2+(y--100)^2=25^2$ $(x-\sqrt{3})^2+(y+100)=625$

2: Find the center and radius for each circle:

	center	radius
a. $(x-8)^2+y^2=9$	(8, 0)	3
b. $(x+2)^2+(y-4)^2=7$	(-2, 4)	$\sqrt{7}$
c. $(x-6)^2+(y+11)^2=99$ $\sqrt{99}$	(6, -11)	$3\sqrt{11}$

Ex 3: What is the standard form of a circle with center (1, -3) (h, k) that passes through the point (2, 2)?

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

$(x-1)^2+(y+3)^2=r^2$ now plug in (2,2) for (x,y)

$(2-1)^2+(2+3)^2=r^2$

$1^2+5^2=r^2$

$1+25=r^2$

$26=r^2$

$(x-1)^2+(y+3)^2=26$

Now try these ☺

1. Write the center and radius for each equation:

a. $(x+3)^2 + (y+5)^2 = 81$ _____ _____

b. $x^2 + y^2 = 900$ _____ _____

c. $(x-6)^2 + (y+30)^2 = 8$ _____ _____

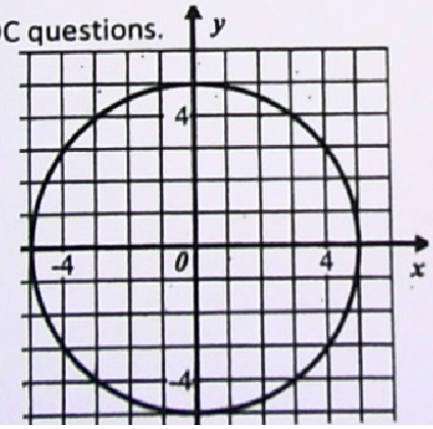
d. $(x-16)^2 + (y+36)^2 = 52$ _____ _____

2. Write the equation of a circle with area 36π and center (4, -7)

_____

Now try the EOC questions.

3.



What is the equation for this circle?

A. $x^2 + y^2 = 25$

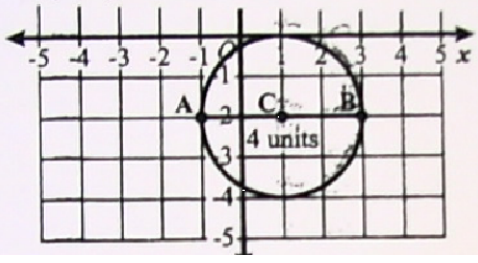
B. $x^2 + y^2 = 100$

C. $(x-5)^2 + (y-5)^2 = 25$

D. $(x-10)^2 + (y-10)^2 = 100$

4.

A circle with center C(1, -2) has a diameter of 4 units.



Which one of the following equations describes the circle?

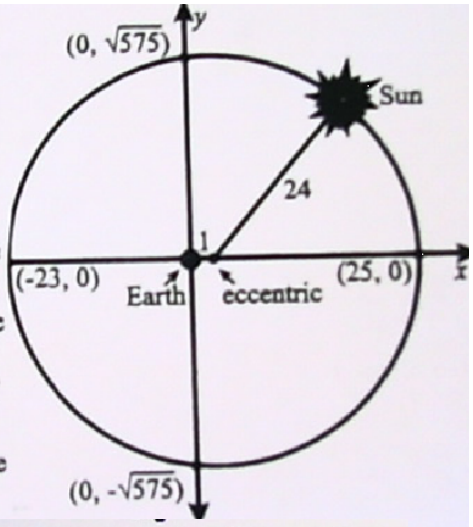
A. $(x+3)^2 + (y-2)^2 = 4$

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

C. $x^2 + (y+1)^2 = 4$

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

5. Hipparchus was an ancient Greek astronomer who lived in the 2nd century BCE. He thought that the Sun moved with constant speed on a circular path around Earth, while Earth stayed in one place. However, to account for his observations he realized that Earth could not be located at the center of the Sun's circular orbit. He named the point that was the center of the orbit the "eccentric." He also estimated that if the distance from Earth to the eccentric was 1 unit, then the radius of the Sun's orbit about the eccentric was 24 units. Assume Earth, the eccentric, and the circular orbit all lie in a plane.



Which of the following equations could describe the orbit of the Sun using Cartesian coordinates where the location of Earth has coordinates (0, 0)?

A. $(x + 1)^2 + y^2 = 25$

B. $(x - 1)^2 + y^2 = 24^2$

C. $(x - 24)^2 + y^2 = 1$

D. $x^2 + y^2 = 24^2$