1pt **Question 1**

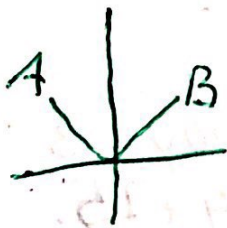What is the standard form of an equation of a circle.

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

2pts 1. For the points $(-1, 2)$ and $(3, -5)$:

(a) Find the distance between them. (Do not round your answer, no decimal.)
(b) Find the midpoint of the line segment that joins them.

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

$= \sqrt{(3--(-1))^2 + (-5-(2))^2}$

$\sqrt{(4)^2 + (-7)^2} = \sqrt{16+49} = \sqrt{65}$

b) $\left(\dfrac{-1+3}{2}, \dfrac{2+-5}{2}\right)$

$\left(1, \dfrac{-3}{2}\right)$

2pts 2. Determine which point $A(-3, 2)$ or $B(+4, 1)$ is closer to the origin? (Must show work for credit.)

$dist(A, O) = \sqrt{(-3+0)^2 + (2-0)^2}$

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

$\sqrt{9+4} = \sqrt{13}$

2pts. 3. If $M(2, 1)$ is the midpoint of the line segment AB, and if A has coordinates $(-1, -3)$, find the coordinates of B.

$2\left(\dfrac{-1+x}{2}\right) = (2)2$

$-1+x = 4$
$+1 \qquad +1$

$x = y^4 - y^2$

$x = 5$

$2\left(\dfrac{-3+y}{2}\right) = (1)(2)$

$-3+y = 2$
$+3 \qquad +3$

$y = 5$

or

$(5, 5)$

1pt 4. Test the equation   for symmetry. (x-axis, y-axis, origin, or none.) **Must show work the supports your answer or you will earn no credit.**

x-axis

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

$x = y^4 - y^2$

yes

y-axis

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

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

NO

origin :

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

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

NO

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5. Find the x- and y-intercepts of the graph of the equation $y = \sqrt{x+7}$

X-int Let y=0

$$(0)^2 = (\sqrt{x+7})^2$$

$$0 = x+7$$

$$\frac{-7 \quad -7}{x = -7}$$

Y-int Let x=0

$$y = \sqrt{0+7}$$

$$y = \sqrt{7}$$

6. Find an equation of the circle with the center at (8 , 1) and a radius of 4 .

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

$$(x-8)^2 + (y-(1))^2 = 4^2$$

$$(x-8)^2 + (y-1)^2 = 16$$

7. Find the center and radius of the circle for the equation of $x^2 + y^2 - 4x + 10y + 13 = 0$

$$(x^2 - 4x + \boxed{4}) + (y^2 + 10y + \boxed{25}) = -13 + 4 + 25$$

$$\frac{-4}{2} = (-2) \qquad \frac{10}{2} = (5)$$

$$(-2)^2 = 4 \qquad (5)^2 = 25$$

$$(x-2)^2 + (y+5)^2 = 16$$

center
(2, -5)
r = 4

8. The endpoints of a diameter of a circle are P(-1, 3) and Q(7, -5). Find the equation of the circle.

Center (Midpoint)

$$\left(\frac{-1+7}{2} , \frac{3+-5}{2} \right)$$

$$\left(\frac{6}{2} , \frac{-2}{2} \right)$$

$$(3, -1)$$

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

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

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

$$(-4)^2 + (4)^2$$

$$16 + 16$$

$$32 = r^2$$

$$(x-3)^2 + (y+1)^2 = 32$$

Intro ch1 sec1-2 Quiz Outline

1) what is the Standard form of an equation of a circle.

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

1. For the points $(-2, 5)$ and $(10, -3)$:

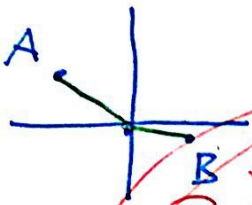(a) Find the distance between them. (Do not round your answer, no decimal.)

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

(b) Find the midpoint of the line segment that joins them.

a) $$dist. = \sqrt{(-2-10)^2+(5-(-3))^2}$$
$$\sqrt{(-12)^2+(8)^2}$$
$$\sqrt{144+64} = \boxed{\sqrt{208}} = \frac{\sqrt{4}\sqrt{52}}{\sqrt{4}} \quad \frac{\sqrt{4}\sqrt{13}}{\sqrt{4}} \ne \boxed{4\sqrt{13}}$$

2. Determine which point $A(-4, 2)$ or $B(3, -1)$ is closer to the origin? (Must show work for credit.)

$$dist(A) = \sqrt{(-4-0)^2+(2-0)^2}$$
$$\sqrt{(-4)^2+(2)^2}$$
$$\sqrt{16+4}$$
$$\sqrt{20}$$

$$dist(B) = \sqrt{(3)^2+(-1)^2}$$
$$\sqrt{9+1}$$
$$\sqrt{10}$$

B is closer

A

B

3. If $M(3, -2)$ is the midpoint of the line segment AB, and if A has coordinates $(-7, 8)$, find the coordinates of B.

$$2\left(\frac{-7+x}{2}\right) = (3)2$$
$$\underset{+7}{-7+x=6} \underset{+7}{}$$
$$\boxed{x=13}$$

$$2\left(\frac{8+y}{2}\right) = (-2)2$$
$$\underset{-8}{8+y=-4}\underset{-8}{}$$
$$\boxed{y=-12}$$

$x^2y^2+xy=1$

4. Test the equation $x^2y^2 + xy = 1$ for symmetry. (x-axis, y-axis, origin, or none.) **Must show work the supports your answer or you will earn no credit.**

x-axis ; $(-y)\leftrightarrow y$
$$x^2(-y)^2+x(-y)=1$$
$$x^2y^2-xy=1$$

NO

y-axis ; $x\to(-x)$
$$(-x)^2y^2+(-x)y=1$$
$$x^2y^2-xy=1$$

NO

origin ; $y\to(-y)$
$$x\to(-x)$$
$$(-x)^2(-y)^2+(-x)(-y)=1$$
$$x^2y^2+xy=1$$

yes

5. Find the x- and y-intercepts of the graph of the equation

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

$x = \pm\sqrt{1}$

$\boxed{x = \pm 1}$

$x = 1, -1$

x-int; Let $y = 0$

$x^2 - x(0) + 0 = 1$

$x^2 = 1$

y-int Let $x = 0$

$0^2 - (0)y + y = 1$

$\boxed{y = 1}$

6. Find an equation of the circle with the center at $(-3, 8)$ and a radius of 5.

$$(x - (-3))^2 + (y - (8))^2 = 5^2$$

$$\boxed{(x + 3)^2 + (y - 8)^2 = 25}$$

7. Find the center and radius of the circle for the equation of:

$$x^2 + y^2 + 2x + y + 1 = 0$$

$$(x^2 + 2x + \boxed{1}) + (y^2 + y + \boxed{\tfrac{1}{4}}) = -1 + 1 + \tfrac{1}{4}$$

$\dfrac{2}{2} = \boxed{1}$ $\dfrac{1}{2} = \boxed{\tfrac{1}{2}}$ $(x + 1)^2 + (y + \tfrac{1}{2})^2 = \tfrac{1}{4}$

$(1)^2 = 1$ $(\tfrac{1}{2})^2 = \tfrac{1}{4}$

$\boxed{\text{center } (-1, -\tfrac{1}{2}) \quad r = \tfrac{1}{2}}$

8. The endpoints of a diameter of a circle are $P(-1, 1)$ and $Q(5, 9)$. Find the equation of the circle.

Midpoint which will
Give center

$\left(\dfrac{-1 + 5}{2}, \dfrac{1 + 9}{2}\right)$

$\left(\dfrac{4}{2}, \dfrac{10}{2}\right)$

$(2, 5)$
  h   k

$(5 - 2)^2 + (9 - 5)^2 =$

$(3)^2 + (4)^2 =$

$9 + 16 = 25$

$$\boxed{(x - 2)^2 + (y - 5)^2 = 25}$$