Math III – Unit 5 Quiz REVIEW   Name: _____Key_____
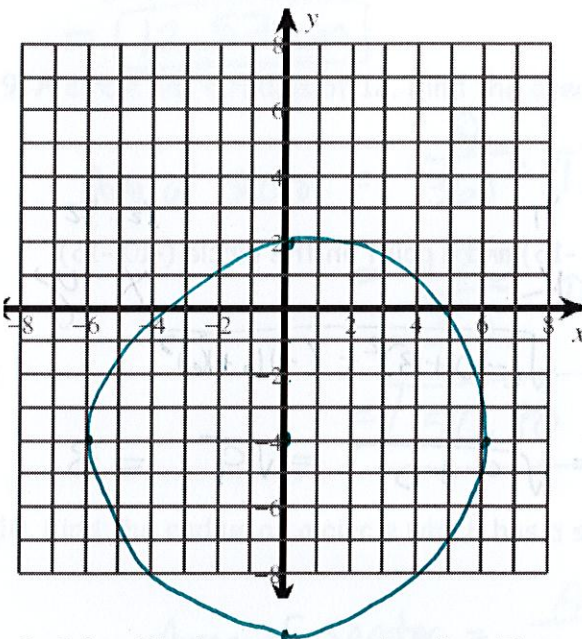
1. Graph and label the center and radius.

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

Center: $(0, -4)$

Radius: 6

2. Graph and label the center and radius.

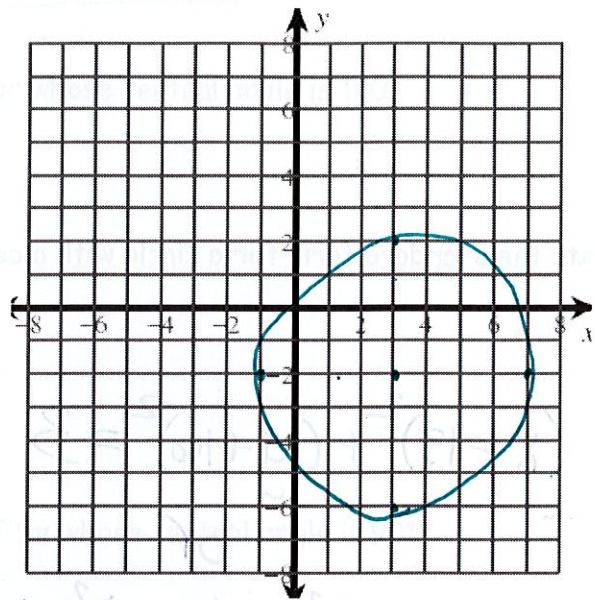$x^2 - 6x + y^2 + 4y - 3 = 0$ *Put in standard form!

$(x^2 - 6x + \boxed{9}) + (y^2 + 4y + \boxed{4}) = 3 + \boxed{9} + \boxed{4}$
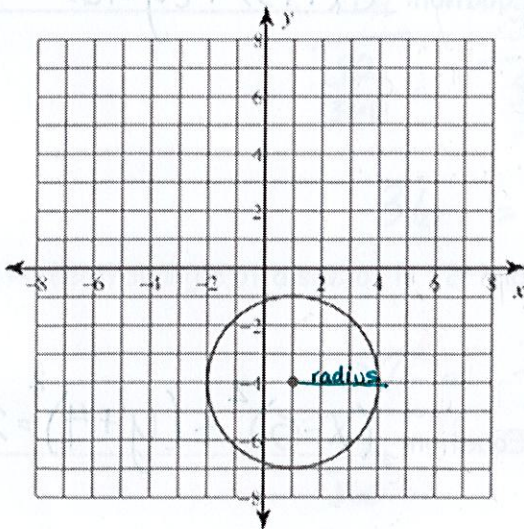
$(x - 3)^2 + (y + 2)^2 = 16$

Center: $(3, -2)$

Radius: 4

3. Identify the center and radius. Then write an equation for the circle.

Center: $(1, -4)$ Radius: 3

radius

square the radius!

Equation: $(x - 1)^2 + (y + 4)^2 = 9$

4. Write the equation of the circle in standard form and then find the center and radius of the circle.

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

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

$$(x^2 - 8x + \boxed{16}) + (y^2 - 6y + \boxed{9}) = -16 + \boxed{16} + \boxed{9}$$

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

Center: $(4, 3)$ Radius: 3

take the
opposite
sign!

$\sqrt{r^2} = \sqrt{9}$
$r = 3$

5. Write the standard form for a circle with a center at (-13, -16) and a point on the circle (-10,-16).

$$\overset{x_1 \quad y_1}{\underset{h \quad k}{}}$$

$$\overset{x_2 \quad y_2}{\underset{x \quad y}{}}$$

$$r = \sqrt{(-10 + 13)^2 + (-16 + 16)^2}$$

$$(x+13)^2 + (y+16)^2 = 3$$

$$= \sqrt{9 + 0} \quad = \sqrt{9} \quad = 3$$

or

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

notes → $(-10 + 13)^2 + (-16 + 16)^2 = r^2$
version

$$\sqrt{9} = \sqrt{r^2}$$

$$r = 3$$

Equation: $(x+13)^2 + (y+16)^2 = 9$

6. Write the equation for the translation.

$(x - 1)^2 + (y + 7)^2 = 25$ right 4 units, up 3 units

take the opposite sign!

center: $(1, -7)$

$$\underline{+4 \quad +3}$$

Equation: $(x-5)^2 + (y+4)^2 = 25$

new center: $(5, -4)$ the radius does not change!
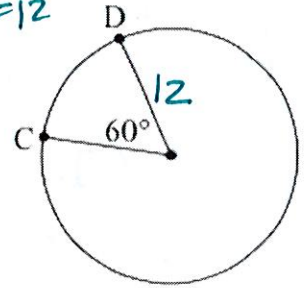
. Find the arc length of AB.
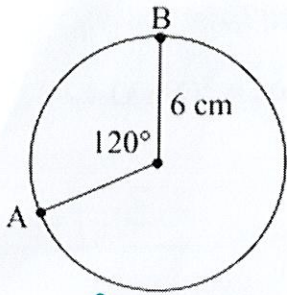
$$S = \frac{\theta}{360} \cdot 2\pi r$$

$$= \frac{120}{360} \cdot 2\pi(6)$$

$$= \boxed{12.57 \text{ cm}}$$

8. The ~~dimeter~~ diameter is 24 cm. Find the arc length of CD.

$$radius = \frac{diameter}{2} = \frac{24}{2} = 12$$

$$S = \frac{\theta}{360} \cdot 2\pi r$$

$$= \frac{60}{360} \cdot 2\pi(12)$$

$$= \boxed{12.57 \text{ cm.}}$$

9. A circle has a radius of 12. Find the area of the sector whose central angle is 120°.

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

$$= \frac{120}{360} \cdot \pi(12)^2$$

$$= \boxed{150.80 \text{ units}^2}$$

10. Find the radius of a circle which has a sector area of 9π whose central angle is 90°.

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

$$\frac{9\pi}{\frac{90}{360}} = \frac{\frac{90}{360} \cdot \pi r^2}{\frac{90}{360}}$$

$$36 = r^2$$

$$\sqrt{r^2} = \sqrt{36}$$

$$\boxed{r = 6}$$

11. The central angle of a sector is 72° and the sector has an area of 5π. Find the radius.

$$\frac{5\pi}{\frac{72}{360}} = \frac{\frac{72}{360} \cdot \pi r^2}{\frac{72}{360}}$$

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

$$\boxed{r = 5}$$