

**King Fahd University of Petroleum and Minerals**  
**Prep-Year Math Program**  
**Math (001)-Term (141)**  
**Recitation (2.2)**

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**Question 1:** Put the equation  $\frac{1}{3}x^2 + 2x + \frac{1}{3}y^2 - y = 0$  in standard form, and find the center and the radius.

**Answer:**  $(x + 3)^2 + \left(y - \frac{3}{2}\right)^2 = \frac{45}{4}$       center =  $\left(-3, \frac{3}{2}\right)$  , radius =  $\frac{\sqrt{45}}{2}$

**Question 2:** Determine which of the following equations represent a:  
 (a) Circle (b) Point (c) Non existence

a)  $x^2 + y^2 + 12x - 18y + 117 = 0$

**Answer : Point**

b)  $x^2 + y^2 + 2x - 6y + 14 = 0$

**Answer : Non existence**

c)  $9x^2 + 12x + 9y^2 - 18y - 23 = 0$

**Answer : Equation of a circle**

**Question 3:** Find an equation of a circle that has a diameter with end points  $(-1, -2)$  and  $(7, -2)$ . Write your answer in standard form.

**Answer:**  $(x - 3)^2 + (y + 2)^2 = 16$

**Question 4:** If the point  $(0, -5)$  and  $(a, b)$  are the endpoints of a diameter of the circle  $x^2 + y^2 - 2x + 4y - 5 = 0$ . Then find  $a$  and  $b$ .

**Answer:**  $a = 2$  and  $b = 1$

**Question 5:**

The general form of the equation of a circle with center  $(-2, 3)$  and tangent to the  $y$ -axis is given by:

A)  $x^2 + y^2 + 4x - 6y + 9 = 0$

B)  $x^2 + y^2 + 4x - 6y + 11 = 0$

C)  $x^2 + y^2 + 4x - 6y + 15 = 0$

D)  $x^2 + y^2 - 4x - 6y - 9 = 0$

E)  $x^2 + y^2 + 4x + 6y + 12 = 0$

**Answer:** A)  $x^2 + y^2 + 4x - 6y + 9 = 0$