

King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 002 - Term 142

Recitation (9.5)

**Question 1:** Solve the system of non-linear equations  $\begin{cases} 4x^2 + 9y^2 = 36 \\ x^2 - y^2 = 25 \end{cases}$

**Answer:** The solution set is

$$SS = \left\{ \left( \frac{3\sqrt{377}}{13}, \frac{8\sqrt{13}}{13}i \right), \left( \frac{3\sqrt{377}}{13}, -\frac{8\sqrt{13}}{13}i \right), \left( -\frac{3\sqrt{377}}{13}, \frac{8\sqrt{13}}{13}i \right), \left( -\frac{3\sqrt{377}}{13}, -\frac{8\sqrt{13}}{13}i \right) \right\}$$

**Question 2:** Solve the system of equations  $\begin{cases} 3x^2 + 2xy + y^2 = 4 \\ 4x^2 + xy + y^2 = 4 \end{cases}$  for rational number ordered pairs.

**Answer:**  $SS = \left\{ (0, -2), (0, 2), \left( \frac{\sqrt{6}}{3}, \frac{\sqrt{6}}{3} \right), \left( -\frac{\sqrt{6}}{3}, -\frac{\sqrt{6}}{3} \right) \right\}$

**Question 3:** The circle  $x^2 + y^2 - 2x = 1$  and the line  $2x + y = 5$  intersect at

A)  $\left( \frac{3}{5}, \frac{19}{5} \right)$  and  $(3, -1)$

D)  $\left( \frac{3}{5}, \frac{19}{5} \right)$  and  $(2, 1)$

B)  $\left( \frac{12}{5}, \frac{1}{5} \right)$  and  $(2, 1)$

E)  $\left( \frac{1}{5}, \frac{23}{5} \right)$  and  $(3, -1)$

C)  $\left( \frac{1}{5}, \frac{23}{5} \right)$  and  $(4, -3)$

**Answer:**  $SS = \left\{ \left( \frac{12}{5}, \frac{1}{5} \right), (2, 1) \right\}$

**Question 4:** The number of intersection points of the graphs of the equation  $x^2 + y^2 = 1$  and  $4x^2 + (y - 3)^2 = 4$  is:

A) 0

**B) 1**

C) 3

D) 2

E) 4

**Answer:** The graph has only **one** intersection point  $(0, 1)$ .

$$SS = \left\{ (2i\sqrt{2}, -3), (-2i\sqrt{2}, -3), (0, 1) \right\}$$

**Question 5:** Number of points of intersection of the graphs of  $y = \frac{6}{x+1}$  and  $y = \frac{x}{x-1}$  is

A) 0

B) 1

C) 3

**D) 2**

E) 4

**Answer:**  $SS = \left\{ (2, 2), \left( 3, \frac{3}{2} \right) \right\}$