

Annamika Okajon
Computer Engineering
19/Eng02/045
Math 102

$$1) x - y - 14 = 0$$

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

$$x = y + 14$$

$$(y + 14)^2 + y^2 - 6x + 8y = 0$$

$$y^2 + 28y + 196 - 6(y + 14) + 8y = 0$$

$$2y^2 + 35y + 112 - 6y - 84 = 0$$

$$2y^2 + 30y + 112 = 0$$

$$y^2 + 15y + 56 = 0$$

$$y^2 + 7y + 8y + 56 = 0$$

$$y(y + 7) + 8(y + 7) = 0$$

$$(y + 7)(y + 8) = 0$$

$$y = -7 \text{ or } -8$$

$$x = y + 14$$

$$x = -7 + 14 \text{ or } x = -8 + 14$$

$$= 7$$

$$= 6$$

\therefore the points of intersection are $(7, -7)$ and $(6, -8)$

$$2) 2x + y - 10 = 0$$

$$x^2 + y^2 + 4x - 6y = 0$$

$$y = 10 - 2x$$

$$x^2 + (10 - 2x)^2 + 4x - 6(10 - 2x) = 0$$

$$x^2 + 100 - 40x + 4x^2 + 4x - 60 + 12x = 0$$

$$5x^2 - 24x + 40 = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$2a$$

$$a = 5, b = -24, c = 40$$

$$x = \frac{24 \pm \sqrt{576 - 800}}{10}$$

\therefore x and y are complex numbers

$$3) \quad x - 5y - 2 = 0$$

$$x^2 + 25y^2 - 6xy - 16 = 0$$

$$x = 2 + 5y$$

$$(2 + 5y)^2 + 25y^2 - 6y(2 + 5y) - 16 = 0$$

$$4 + 20y + 25y^2 + 25y^2 - 12y - 30y^2 - 16 = 0$$

$$20y^2 + 8y - 12 = 0$$

$$5y^2 + 2y - 3 = 0$$

$$5y(y+1) - 3(y+1) = 0$$

$$(5y-3)(y+1) = 0$$

$$5y-3=0 \quad \text{or} \quad y+1=0$$

$$y = \frac{3}{5}$$

$$y = -1$$

$$x = 2 + 5y$$

$$x = 2 + 5\left(\frac{3}{5}\right) \quad \text{or} \quad x = 2 + 5(-1)$$

$$= 2 + 3$$

$$= 2 - 5$$

$$= 5$$

$$= -3$$

Point of intersection are $(5, \frac{3}{5})$ and $(-3, -1)$