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Mechanical Engineering  
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1)  $x - y - 14 = 0$  assignment

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

$$x = y + 14$$

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

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

$$2y^2 + 36y + 196 - 6y - 84 = 0$$

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

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

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

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

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

$$x = y + 14$$

$$x = -7 + 14$$

$$x = 7$$

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

$$x = 6$$

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

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

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

$$x = 2 + 5y$$

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

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

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

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

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

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

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

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

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

$$x = 2 + 5y$$

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

$$x = 2 + 3 \quad \text{or} \quad x = 2 - 5$$

$$x = 5 \quad \text{or} \quad x = -3$$

Points of intersection are (5, 3/5) and (-3, -1)