19/ENG05/054 MECHATRONICS ENGINEERING

OMOLUABI SEAN SEREMI

MAT 102

i) $x - y - 14 = 0$

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

$x = 14 + y$

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

$y^2 + 196 + 28y + y^2 - 84 - 6y + 8y = 0$

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

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

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

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

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

$y = -7$ or $y = -8$

when $y = -7$, $x = 14 - 7 = 7$

and when $y = -8$, $x = 14 - 8 = 6$

Points of intersection $= (7, -7)$ and $(6, -8)$

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

$y = 10 - 2x$

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

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

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

* Roots are complex

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

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

$x = 5y + 2$

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

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

$\frac{20y^2 + 8y - 12 = 0}{4}$

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

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

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

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

$y = -1$ or $y = 3/5$

when $y = -1$, $x = 5y + 2 = 5 \times -1 + 2 = -3$

and $y = 3/5$, $x = 5y + 2 = \cancel{5} \times 3/\cancel{5} + 2 = 5$

$P = (-3, -1)$, and $(5, 3/5)$