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Assignment

1) $x - y - 14 = 0$
$x^2 + y^2 - 6x + 8y = 0$
$x = y + 14$
$(y+14)^2 + y^2 - 6x + 8y = 0$
$y^2 + 28y + 196 + y^2 - 6(y+14) + 8y = 0$
$2y^2 + 36y + 196 - 6y - 84 = 0$
$2y^2 + 30y + 112 = 0$
$y^2 + 15y + 56 = 0$
$y^2 + 7y + 8y + 56 = 0$
$y(y+7) + 8(y+7) = 0$
$(y+7)(y+8) = 0$
$y = -7$ or -8
$x = y + 14$
$x = -7 + 14$ or $x = -8 + 14$
$x = 7$ $x = 6$
Hence the points of intersection are $(7, -7)$ and $(6, -8)$

2) $2x + y - 10 = 0$
$x^2 + y^2 + 4x - 6y = 0$
$y = 10 - 2x$
$x^2 + (10 - 2x)^2 + 4x - 6(10 - 2x) = 0$
$x^2 + 100 - 40x + 4x^2 + 4x - 60 + 12x = 0$
$5x^2 - 36x - 24x + 40 = 0$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
$a = 5, b = -24, c = 40$
$x = \frac{24 \pm \sqrt{576 - 800}}{10}$
$\therefore x$ & y are complex numbers

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

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

$x = 2 + 5y$

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

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

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

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

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

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

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

$5y - 3 = 0$ or $y + 1 = 0$

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

$x = 2 + 5y$

$x = 2 + 5(3/5)$ or $x = 2 + 5(-1)$

$x = 2 + 3$ or $x = 2 - 5$

$x = 5$ or $x = -3$

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