Mathematics 10D

1.4 – Solving Linear Systems by Substitution

Mr. D. Hagen

1) $y = -8x - 4$
   $y = \boxed{2x + 6}$

The PoI is a shared (x, y).

$2x + 6 = -8x - 4$

$10x = -10$

$x = -1$

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$y = -8(-1) - 4$

$y = 4$

$\therefore$ PoI is $(-1, 4)$

2) $4x - 2y = 6$

$y = 4x - 13$

$4x - 2(4x - 13) = 6$

$4x - 8x + 26 = 6$

$-4x = -20$

$x = \boxed{5}$

$y = 4(5) - 13$

$y = 7$

$\therefore$ PoI is $(5, 7)$

3) $x - 8y = -8 \Rightarrow x = 8y - 8$

$6x + 5y = 5$

$6(8y - 8) + 5y = 5$

$42y - 42 + 5y = 5$

$47y = 47$

$y = 1$

$x = 8(1) - 8$

$x = 0$

$\therefore P_0 I : (0, 1)$

4) $2x - y = -9 \quad \Rightarrow \quad y = 2x + 9$

$-4x + 7y = 13$

$-4x + 7(2x + 9) = 13$

$-4x + 14x + 63 = 13$

$10x = -50$

$x = \boxed{-5}$

$y = 2(-5) + 9$

$y = -1$

$\therefore$ PoI is $(-5, -1)$

5) $2(x + y) = 5(x - 1) + y$

$\quad\quad 3(y - 4) = 7(x - 2) + 2y + 1$

$2x + 2y = 5x - 5 + y$

$y = 3x - 5$

$y = 3(1) - 5$

$y = -2$

$\therefore \text{PoI is } (1, -2)$

$3(3x - 5 - 4) = 7(x - 2) + 2(3x - 5) + 1$

$9x - 27 = 7x - 14 + 6x - 10 + 1$

$-4x = 4 \quad \boxed{x = 1}$

6) $x - y = 5$
   $-2x + 2y = 5$

7) $x + 7y = 3$
   $-3x - 21y = -9$