

An Independent System with a Unique Solution

E1 $x + 3y - z = 4$

E2 $-3x - 8y + z = -16$

E3 $4x + 14y - 7z = 11$

$ax + by + cz = d$

$ey + fz = g$

$hz = i$

Shooting for triangular form.
1x in top left is ideal

$3E1 + E2:$ $3(x + 3y - z = 4)$

$3E1:$ $3x + 9y - 3z = 12$

$E2:$ $-3x - 8y + z = -16$

$y - 2z = -4$

New System:

$x + 3y - z = 4$

$y - 2z = -4$

$2y - 3z = -5$

$-4E1 + E3:$

$-4E1:$ $-4x - 12y + 4z = -16$

$E3:$ $4x + 14y - 7z = 11$

$2y - 3z = -5$

$-2E2 + E3$

$-2E2:$ $-2y + 4z = 8$

$2y - 3z = -5$

$z = 3$

New System

$x + 3y - z = 4$

$y - 2z = -4$

$z = 3$

$y - 2z = y - 2(3) = -4$

$y - 6 = -4$

$y = 2$

$x + 3y - z = x + 3(2) - 3 = 4$

$x + 6 - 3 = x + 3 = 4$

$x = 1$

Sol'n:

$(x, y, z) = (1, 2, 3)$

Sol'n Set:

$(x, y, z) \in \{(1, 2, 3)\}$