# Notes 10.1 and 10.2:

→***Solving a system of 2 equations:***

***Elimination/addition method*

***Substitution method*

***Solution = ordered pair (x, y)*
*= point of intersection*

## →Solving a system of 3 equations:

1st Eliminate the same variable using two equations at a time.

2nd Solve the resulting system of 2 equations.

3rd Substitute back into previous equations to find other variables.

**Solution = ordered triple (x, y, z)
= point of intersection

# 10.1 #6 → solve using the substitution method

**10.1 #6-12even**
**10.2 #8, 19-26**

Express your final answer as a point of intersection (ordered pair or ordered triple)

**CHECK ODD ANSWERS IN BOOK**

CHECK EVEN ANSWERS BELOW:

| | | | | | |
|---|---|---|---|---|---|
| -3 | -3 | -2 | -2 | ~~-2~~ | -2 |
| -1 | -1 | -1 | | | |
| 1 | 1 | 1 | 1 | ~~1~~ | |
| 2 | 2 | 2 | 3 | 3 | |
| 4 | 4 | 4 | 5 | | |

$3x + y = 1$

$5x + 2y = 1$

$\rightarrow y = -3x + 1$

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

$5x - 6x + 2 = 1$

$-x + 2 = 1$

$-x = -1$

$x = 1$

$3(1) + y = 1$

$3 + y = 1$

$y = -2$

$(1, -2)$

# 10.1 #10 → solve using the elimination method

$2x + 5y = 15$

$4x + y = 21$

$-4(4x + y = 21) \rightarrow -4x - 4y = -84$

$-4x - 10y = -30$

$-9y = -9$

$y = 1$

$2x + 5(1) = 15$

$2x = 10$

$x = 5$

$(5, 1)$

# 10.2 → Use back-substitution to solve

**#8** $3x - 3y + z = 0$

$y + 4z = 10$

$z = 3$

$y + 4(3) = 10$

$y + 12 = 10$

$y = -2$

Point of Intersection:

(-3, -2, 3)

$3x - 3(-2) + 3 = 0$

$3x + 6 + 3 = 0$

$3x + 9 = 0$

$3x = -9$

$x = -3$

# 10.2 #19: Find the point of intersection

$x + 2y - z = -6$

$y - 3z = -16$

$x - 3y + 2z = 14$

$-1(x + 2y - z = -6)$

$-x - 2y + z = 6$

add

1st $-5y + 3z = 20$

2nd $y - 3z = -16$

$-5y + 3z = 20$

$-4y = 4$

$y = -1$

3rd $-1 - 3z = -16$

$-3z = -15$

$z = 5$

4th $x + 2(-1) - 5 = -6$

$x - 2 - 5 = -6$

$x - 7 = -6$

$x = 1$

Point of Intersection:

(1, -1, 5)