Advanced Algebra

Unit 6: Advanced Systems of Equations

Assignment #4- 3 variables and 3 unknowns.

Using Elimination 3 times, find the solutions to the following three equations and three unknowns.

1) $\begin{cases} x+y+z=6 \\ 2x+4y+z=5 \\ 2x+3y+z=6 \end{cases}$

Use 1&2

$x+y+z=6$

$-2x-4y-z=-5$

$-x-3y=1$

2&3

$2x+4y+z=5$

$-2x-3y-z=-6$

$y=-1$

$-x+3=1$

$-x=-2$

$x=2$

$(2,-1,5)$

2) $\begin{cases} x+4y+11z=7 \\ x+6y+17z=9 \\ x+4y+8z=4 \end{cases}$

$(4,-2,1)$

Use 1&2

$x+4y+11z=7$

$-x-6y-17z=-9$

$-2y-6z=-2$

Use 2&3

$x+6y+17z=9$

$-x-4y-8z=-4$

$2y+9z=5$

$3z=3$

$z=1$

3) $\begin{cases} 2x+3y+z=22 \\ -3x+y+z=4 \\ x+y+z=12 \end{cases}$

1&2

$2x+3y+z=22$

$3x-y-z=-4$

$5x+2y=18$

$-10+2y=18$

$2y=28$

$y=14$

2&3

$-3x+y+z=4$

$-x-y-z=-12$

$-4x=-8$

$x=-2$

$-2+14+z=12$

$z=0$

4) $\begin{cases} 2x+2y+z=14 \\ -3x+y-z=-11 \\ 5x+4y+z=27 \end{cases}$

$6+4$

$z=4$

1&2 $2x+2y+z=14$

$-3x+y-z=-11$

$-x+3y=3$

2&3 $-3x+y-z=-11$

$5x+4y+z=27$

$2x+5y=16$

now use these

$-2x+6y=6$

$2x+5y=16$

$11y=22$

$y=2$

$2x=6$

$x=3$

$(3,2,4)$