Intermediate Algebra Skill
Solving 3 x 3 Linear System by Substitution

Solve the following Linear Systems of Equations by Substitution:

1) $\begin{cases} 2x-y+z=10 \\ 4x+2y-3z=10 \\ x-3y+2z=8 \end{cases}$

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

3) $\begin{cases} 6x-4y+5z=31 \\ 5x+2y+2z=13 \\ x+y+z=2 \end{cases}$

4) $\begin{cases} x+y+z=0 \\ 2x+3y+2z=-3 \\ -x+2y-3z=-1 \end{cases}$

5) $\begin{cases} 2x+y-3z=-4 \\ 4x-2y+z=9 \\ 3x+5y-2z=5 \end{cases}$

6) $\begin{cases} 2x+y+2z=11 \\ 3x+2y+2z=8 \\ x+4y+3z=0 \end{cases}$

7) $\begin{cases} -2x+8y+2z=4 \\ x+6y+3z=4 \\ 3x-2y+z=0 \end{cases}$

8) $\begin{cases} a+2b+c=1 \\ 7a+3b-c=-2 \\ a+5b+3c=2 \end{cases}$

9) $\begin{cases} 5x+3y+\dfrac{1}{2}z=\dfrac{7}{2} \\ 0.5x-0.9y-0.2z=0 \\ 3x-2.4y+0.4z=-1 \end{cases}$

10) $\begin{cases} 3p+2r=11 \\ q-7r=4 \\ p-6q=1 \end{cases}$

11) $\begin{cases} x+y+z=105 \\ 10y-z=11 \\ 2x-3y=7 \end{cases}$

12) $\begin{cases} 2a-3b=2 \\ 7a+4c=\dfrac{3}{4} \\ 2c-3b=1 \end{cases}$

13) $\begin{cases} x+y+z=180 \\ y=2+3x \\ z=80+x \end{cases}$

14) $\begin{cases} x+y=0 \\ x+z=1 \\ 2x+y+z=2 \end{cases}$

Answers to Solving 3 x 3 Linear System by Substitution

1) $(4,0,2)$

2) $(2,-2,2)$

3) $(3,-2,1)$

4) $(7,-3,-4)$

5) $(2,1,3)$

6) $(2,-5,6)$

7) *Dependent*

8) $(3,-5,8)$

9) $\left(\dfrac{3}{5},\dfrac{2}{3},-3\right)$

10) $\left(4,\dfrac{1}{2},-\dfrac{1}{2}\right)$

11) $(17,9,79)$

12) $\left(\dfrac{1}{4},-\dfrac{1}{2},-\dfrac{1}{4}\right)$

13) $\left(\dfrac{98}{5},\dfrac{304}{5},\dfrac{498}{5}\right)$

14) $\varnothing$