

4.4 Practice - Three Variables

Solve each of the following systems of equation.

1) $a - 2b + c = 5$
 $2a + b - c = -1$
 $3a + 3b - 2c = -4$

2) $2x + 3y = z - 1$
 $3x = 8z - 1$
 $5y + 7z = -1$

3) $3x + y - z = 11$
 $x + 3y = z + 13$
 $x + y - 3z = 11$

4) $x + y + z = 2$
 $6x - 4y + 5z = 31$
 $5x + 2y + 2z = 13$

5) $x + 6y + 3z = 4$
 $2x + y + 2z = 3$
 $3x - 2y + z = 0$

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

7) $x + y + z = 6$
 $2x - y - z = -3$
 $x - 2y + 3z = 6$

8) $x + y - z = 0$
 $x + 2y - 4z = 0$
 $2x + y + z = 0$

9) $x + y - z = 0$
 $x - y - z = 0$
 $x + y + 2z = 0$

10) $x + 2y - z = 4$
 $4x - 3y + z = 8$
 $5x - y = 12$

11) $-2x + y - 3z = 1$
 $x - 4y + z = 6$
 $4x + 16y + 4z = 24$

12) $4x + 12y + 16z = 4$
 $3x + 4y + 5z = 3$
 $x + 8y + 11z = 1$

13) $2x + y - 3z = 0$
 $x - 4y + z = 0$
 $4x + 16y + 4z = 0$

14) $4x + 12y + 16z = 0$
 $3x + 4y + 5z = 0$
 $x + 8y + 11z = 0$

15) $3x + 2y + 2z = 3$
 $x + 2y - z = 5$
 $2x - 4y + z = 0$

16) $p + q + r = 1$
 $p + 2q + 3r = 4$
 $4p + 5q + 6r = 7$

17) $x - 2y + 3z = 4$
 $2x - y + z = -1$
 $4x + y + z = 1$

18) $x + 2y - 3z = 9$
 $2x - y + 2z = -8$
 $3x - y - 4z = 3$

19) $x - y + 2z = 0$
 $x - 2y + 3z = -1$
 $2x - 2y + z = -3$

20) $4x - 7y + 3z = 1$
 $3x + y - 2z = 4$
 $4x - 7y + 3z = 6$

21) $4x - 3y + 2z = 40$
 $5x + 9y - 7z = 47$
 $9x + 8y - 3z = 97$

22) $3x + y - z = 10$
 $8x - y - 6z = -3$
 $5x - 2y - 5z = 1$

$$\begin{aligned}
 23) \quad & 3x + 3y - 2z = 13 \\
 & 6x + 2y - 5z = 13 \\
 & 5x - 2y - 5z = -1
 \end{aligned}$$

$$\begin{aligned}
 24) \quad & 2x - 3y + 5z = 1 \\
 & 3x + 2y - z = 4 \\
 & 4x + 7y - 7z = 7
 \end{aligned}$$

$$\begin{aligned}
 25) \quad & 3x - 4y + 2z = 1 \\
 & 2x + 3y - 3z = -1 \\
 & x + 10y - 8z = 7
 \end{aligned}$$

$$\begin{aligned}
 26) \quad & 2x + y = z \\
 & 4x + z = 4y \\
 & y = x + 1
 \end{aligned}$$

$$\begin{aligned}
 27) \quad & m + 6n + 3p = 8 \\
 & 3m + 4n = -3 \\
 & 5m + 7n = 1
 \end{aligned}$$

$$\begin{aligned}
 28) \quad & 3x + 2y = z + 2 \\
 & y = 1 - 2x \\
 & 3z = -2y
 \end{aligned}$$

$$\begin{aligned}
 29) \quad & -2w + 2x + 2y - 2z = -10 \\
 & w + x + y + z = -5 \\
 & 3w + 2x + 2y + 4z = -11 \\
 & w + 3x - 2y + 2z = -6
 \end{aligned}$$

$$\begin{aligned}
 30) \quad & -w + 2x - 3y + z = -8 \\
 & -w + x + y - z = -4 \\
 & w + x + y + z = 22 \\
 & -w + x - y - z = -14
 \end{aligned}$$

$$\begin{aligned}
 31) \quad & w + x + y + z = 2 \\
 & w + 2x + 2y + 4z = 1 \\
 & -w + x - y - z = -6 \\
 & -w + 3x + y - z = -2
 \end{aligned}$$

$$\begin{aligned}
 32) \quad & w + x - y + z = 0 \\
 & -w + 2x + 2y + z = 5 \\
 & -w + 3x + y - z = -4 \\
 & -2w + x + y - 3z = -7
 \end{aligned}$$



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Answers - Three Variables

- | | | |
|------------------------|----------------------------|--|
| 1) $(1, -1, 2)$ | 12) ∞ solutions | 23) $(2, 3, 1)$ |
| 2) $(5, -3, 2)$ | 13) $(0, 0, 0)$ | 24) ∞ solutions |
| 3) $(2, 3, -2)$ | 14) ∞ solutions | 25) no solutions |
| 4) $(3, -2, 1)$ | 15) $(2, \frac{1}{2}, -2)$ | 26) $(1, 2, 4)$ |
| 5) $(-2, -1, 4)$ | 16) ∞ solutions | 27) $(-25, 18, -25)$ |
| 6) $(-3, 2, 1)$ | 17) $(-1, 2, 3)$ | 28) $(\frac{2}{7}, \frac{3}{7}, -\frac{2}{7})$ |
| 7) $(1, 2, 3)$ | 18) $(-1, 2, -2)$ | 29) $(1, -3, -2, -1)$ |
| 8) ∞ solutions | 19) $(0, 2, 1)$ | 30) $(7, 4, 5, 6)$ |
| 9) $(0, 0, 0)$ | 20) no solution | 31) $(1, -2, 4, -1)$ |
| 10) ∞ solutions | 21) $(10, 2, 3)$ | 32) $(-3, -1, 0, 4)$ |
| 11) $(19, 0, -13)$ | 22) no solution | |



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