

Practice - Solving Equations with 3 Variables

Solve each of the following systems of equation.

$$\begin{aligned} 1) \quad & a - 2b + c = 5 \\ & 2a + b - c = -1 \\ & 3a + 3b - 2c = -4 \end{aligned}$$

$$\begin{aligned} 3) \quad & 3x + y - z = 11 \\ & x + 3y = z + 13 \\ & x + y - 3z = 11 \end{aligned}$$

$$\begin{aligned} 5) \quad & x + 6y + 3z = 4 \\ & 2x + y + 2z = 3 \\ & 3x - 2y + z = 0 \end{aligned}$$

$$\begin{aligned} 7) \quad & x + y + z = 6 \\ & 2x - y - z = -3 \\ & x - 2y + 3z = 6 \end{aligned}$$

$$\begin{aligned} 9) \quad & x + y - z = 0 \\ & x - y - z = 0 \\ & x + y + 2z = 0 \end{aligned}$$

$$\begin{aligned} 11) \quad & -2x + y - 3z = 1 \\ & x - 4y + z = 6 \\ & 4x + 16y + 4z = 24 \end{aligned}$$

$$\begin{aligned} 13) \quad & 2x + y - 3z = 0 \\ & x - 4y + z = 0 \\ & 4x + 16y + 4z = 0 \end{aligned}$$

$$\begin{aligned} 15) \quad & 3x + 2y + 2z = 3 \\ & x + 2y - z = 5 \\ & 2x - 4y + z = 0 \end{aligned}$$

$$\begin{aligned} 17) \quad & x - 2y + 3z = 4 \\ & 2x - y + z = -1 \\ & 4x + y + z = 1 \end{aligned}$$

$$\begin{aligned} 19) \quad & x - y + 2z = 0 \\ & x - 2y + 3z = -1 \\ & 2x - 2y + z = -3 \end{aligned}$$

$$\begin{aligned} 21) \quad & 4x - 3y + 2z = 40 \\ & 5x + 9y - 7z = 47 \\ & 9x + 8y - 3z = 97 \end{aligned}$$

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

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

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

$$\begin{aligned} 29) \quad & -2w + 2x + 2y - 2z = -10 \\ & w + x + y + z = -5 \\ & 3w + 2x + 2y + 4z = 1 \\ & w + 3x - 2y + 2z = -6 \end{aligned}$$

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

$$\begin{aligned} 2) \quad & 2x + 3y = z - 1 \\ & 3x = 8z - 1 \\ & 5y + 7z = -1 \end{aligned}$$

$$\begin{aligned} 4) \quad & x + y + z = 2 \\ & 6x - 4y + 5z = 31 \\ & 5x + 2y + 2z = 13 \end{aligned}$$

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

$$\begin{aligned} 8) \quad & x + y - z = 0 \\ & x + 2y - 4z = 0 \\ & 2x + y + z = 0 \end{aligned}$$

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

- $$5x - y = 12$$
- 12) $4x + 12y + 16z = 4$
 $3x + 4y + 5z = 3$
 $x + 8y + 11z = 1$
- 14) $4x + 12y + 16z = 0$
 $3x + 4y + 5z = 0$
 $x + 8y + 11z = 0$
- 16) $p + q + r = 1$
 $p + 2q + 3r = 4$
 $4p + 5q + 6r = 7$
- 18) $x + 2y - 3z = 9$
 $2x - y + 2z = -8$
 $3x - y - 4z = 3$
- 20) $4x - 7y + 3z = 1$
 $3x + y - 2z = 4$
 $4x - 7y + 3z = 6$
- 22) $3x + y - z = 10$
 $8x - y - 6z = -3$
 $5x - 2y - 5z = 1$
- 24) $2x - 3y + 5z = 1$
 $3x + 2y - z = 4$
 $4x + 7y - 7z = 7$
- 26) $2x + y = z$
 $4x + z = 4y$
 $y = x + 1$
- 28) $3x + 2y = z + 2$
 $y = 1 - 2x$
 $3z = -2y$
- 30) $-w + 2x - 3y + z = -8$
 $-w + x + y - z = -4$
 $w + x + y + z = 22$
 $-w + x - y - z = -4$
- 32) $w + x - y + z = 0$
 $-w + 2x + 2y + z = 5$
 $-w + 3x + y - z = -4$
 $-2w + x + y - 3z = -7$



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Answers - Solving Equations with 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) $(-25, 19, -25)$ |
| 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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