

$$3a. \textcircled{1} \quad x + 5y = 2$$

$$\textcircled{2} \quad x - 1 = 2y + 1$$

$$x = 2y + 1$$

$$x + 5y = 2$$

$$2y + 1 + 5y = 2$$

$$7y + 1 = 2$$

$$7y = 1$$

$$y = \frac{1}{7}$$

$$x = 2y + 1$$

$$x = 2\left(\frac{1}{7}\right) + 1$$

$$x = \frac{2}{7} + \frac{7}{7}$$

$$x = \frac{9}{7}$$

$$\left(\frac{9}{7}, \frac{1}{7}\right)$$

$$4b. \quad (x, y, z)$$

$$2x - 3y + 4z = 8$$

$$3x + 2y = 7$$

$$x = 1$$

$$3(1) + 2y = 7$$

$$3 + 2y = 7$$

$$2y = 4$$

$$y = 2$$

$$2(1) - 3(2) + 4z = 8$$

$$2 - 6 + 4z = 8$$

$$-4 + 4z = 8$$

$$\frac{4z}{4} = \frac{12}{4}$$

$$z = 3$$

$$(1, 2, 3)$$

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$$y = 2x + 7$$

$$y = 3x + 5$$

$$\begin{array}{r} 2x + 7 = 3x + 5 \\ -2x \quad -5 \quad -2x \quad -5 \end{array}$$

$$2 = x$$

$$11 = y$$

3.2 Elimination

→ Addition

Subtraction

Coefficients of
1 variable
need to be
oppositesCoefficients of
1 variable need to
be the same

$$\begin{array}{r} -2x + 3y = -14 \\ + 2x + 2y = 4 \\ \hline \end{array}$$

$$\begin{array}{r} 5y = -10 \\ \frac{5}{5} \quad \frac{-10}{5} \end{array}$$

$$y = -2$$

$$2x + 2(-2) = 4$$

$$2x - 4 = 4$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

$$(4, -2)$$

$$19. \quad \begin{aligned} 7b - 5c &= 11 \\ -4c - 2b &= -14 \end{aligned}$$

$$\begin{aligned} -4 \cdot 7b - 5c &= 11 \\ 5 \cdot -2b - 4c &= -14 \end{aligned}$$

$$\begin{aligned} -28b + 20c &= -44 \\ + \quad -10b - 20c &= -70 \\ \hline -38b &= -114 \\ \underline{-38} & \quad \underline{-38} \end{aligned}$$

$$b = 3$$

$$-2(3) - 4c = -14$$

$$-6 - 4c = -14$$

$$\begin{aligned} -4c &= -8 \\ \underline{-4} & \quad \underline{-4} \end{aligned}$$

$$c = 2$$

$$(3, 2)$$

Consistent
Independent

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10, 12, 22, 24

$$2. \quad \begin{array}{r} -8x + 4y = -2 \\ 4x - 2y = 1 \end{array} \quad \begin{array}{l} \text{Same} \\ \text{Line} \end{array}$$

$$\begin{array}{r} -8x + 4y = -2 \\ + \quad 8x - 4y = 2 \\ \hline 0 = 0 \end{array} \quad \begin{array}{l} \text{True} \\ \text{Infinitely many solutions} \end{array}$$

Consistent
Dependent

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21.

$$\begin{array}{r} 5x - 8 = 3y + 8 \\ 10x - 6y = 18 \end{array}$$

$$\div 2 \quad \begin{array}{r} 5x - 3y = 8 \\ 10x - 6y = 18 \end{array}$$

$$\begin{array}{r} 5x - 3y = 8 \\ + \quad -5x + 3y = -9 \\ \hline 0 = -1 \end{array} \quad \begin{array}{l} \text{Parallel} \\ \text{Lines} \\ \text{False} \\ \text{No Solution} \\ \text{Inconsistent} \end{array}$$