Systems of Linear Equations in Two Variables

1.
$$8x + 2y = 7$$
 \checkmark

$$\frac{2y}{2} = \frac{-8x}{2} + \frac{7}{2} \checkmark$$

$$y = -4x + \frac{7}{2} \checkmark$$

$$m_1 = -4 \checkmark$$

$$b_1 = \frac{7}{2} \checkmark$$

$$y = -4x + 1 \checkmark$$

$$m_2 = -4 \checkmark$$

$$b_2 = 1 \checkmark$$

$$m_1 = m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore$$
 Inconsistent, Independent

$$b_2 = \frac{14}{3} \checkmark$$

$$m_1 \neq m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Consistent, Independent } \checkmark$$
3. $x + 3y = 8 \checkmark$

$$3y \qquad x \qquad 8$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Consis}$$
3. $x + 3y = \frac{3y}{3} = -\frac{x}{3}$

$$y = -\frac{1}{3}x$$

$$m_1 = -\frac{1}{3}x$$

2.
$$x-2y = 9$$

 $\frac{-2y}{-2} = \frac{-x}{-2} + \frac{9}{-2}$
 $y = \frac{1}{2}x - \frac{9}{2}$
 $m_1 = \frac{1}{2}$
 $b_1 = -\frac{9}{2}$
 $x + 3y = 14$
 $\frac{3y}{3} = -\frac{x}{3} + \frac{14}{3}$
 $y = -\frac{1}{2}x + \frac{14}{2}$

$$m_1 = -\frac{1}{3} \checkmark$$

$$b_1 = \frac{8}{3} \checkmark$$

$$x - 3y = 8 \checkmark$$

$$-3y = \frac{-x}{-3} + \frac{8}{-3} \checkmark$$

$$y = \frac{1}{3}x - \frac{8}{3} \checkmark$$

$$m_2 = \frac{1}{3} \checkmark$$

$$b_2 = -\frac{8}{3} \checkmark$$

$$m_1 \neq m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore Consistent, Independent \\checkmark$$

$$\frac{2y}{2} = \frac{6x}{2} - \frac{5}{2} \checkmark$$

$$y = 3x - \frac{5}{2} \checkmark$$

$$m_1 = 3 \checkmark$$

$$b_1 = -\frac{5}{2} \checkmark$$

$$\frac{3y}{3} = \frac{9x}{3} + \frac{1}{3} \checkmark$$

$$y = 3x + \frac{1}{3} \checkmark$$

$$m_2 = 3 \checkmark$$

$$b_2 = \frac{1}{3} \checkmark$$

$$m_1 = m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Inconsistent, Independent}$$

$$3x + 5y = 15 \checkmark$$

$$5y = -3x + \frac{15}{3} \checkmark$$

$$3x + 5y = 15 \checkmark$$

$$\frac{5y}{5} = \frac{-3x}{5} + \frac{15}{5} \checkmark$$

$$y = -\frac{3}{5}x + 3 \checkmark$$

$$m_1 = -\frac{3}{5}$$

$$\frac{b_1 = 3}{\sqrt{7}} \checkmark$$

$$\frac{b_1 = 3}{\sqrt{7}} \checkmark$$

$$\frac{-7y}{-7} = \frac{-4x}{-7} + \frac{10}{-7} \checkmark$$

$$y = \frac{4}{7}x - \frac{10}{7} \checkmark$$

$$m_2 = \frac{4}{7} \checkmark$$

$$m_1 \neq m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \quad \text{Consistent, Independent} \checkmark$$

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$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Inconsistent, Independent}$$

$$\therefore x - 2y = 9 \checkmark$$

$$\frac{-2y}{-2} = \frac{-x}{-2} + \frac{9}{-2} \checkmark$$

$$y = \frac{1}{2}x - \frac{9}{2} \checkmark$$

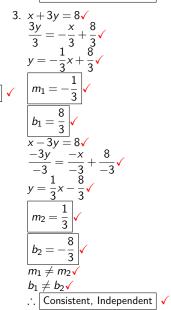
ons in Two Variables
$$m_2 = -\frac{1}{3} \checkmark$$

$$b_2 = \frac{14}{3} \checkmark$$

$$m_1 \neq m_2 \checkmark$$

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$$\therefore \text{ Consistent, Independent } \checkmark$$



$$y = 3x - \frac{5}{2} \checkmark$$

$$m_1 = 3 \checkmark$$

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$$\frac{3y}{3} = \frac{9x}{3} + \frac{1}{3} \checkmark$$

$$y = 3x + \frac{1}{3} \checkmark$$

$$m_2 = 3 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Inconsistent, Independent } \checkmark$$

$$5. \quad 3x + 5y = 15 \checkmark$$

$$\frac{5y}{5} = \frac{-3x}{5} + \frac{15}{5} \checkmark$$

$$y = -\frac{3}{5}x + 3 \checkmark$$

$$m_1 = -\frac{3}{5} \checkmark$$

$$b_1 = 3 \checkmark$$

$$4x - 7y = 10 \checkmark$$

$$-\frac{7y}{-7} = \frac{-4x}{-7} + \frac{10}{-7} \checkmark$$

$$y = \frac{4}{7}x - \frac{10}{7} \checkmark$$

$$m_2 = \frac{4}{7} \checkmark$$

$$m_1 \neq m_2 \checkmark$$

$$b_1 \neq b_2 \checkmark$$

$$\therefore \text{ Consistent, Independent } \checkmark$$