Activity 1.8.2: Categorizing Systems of Linear Equations in Two Variables

Total points = 21

Answers

1. $\begin{cases} 8x + 2y = 7 \\ y = -4x + 1 \end{cases}$

$\begin{cases} 8x + 2y = 7 \\ 4x + y = 1 \end{cases}$ ✓

$\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ✓

$\dfrac{8}{4} = \dfrac{2}{1} = \dfrac{7}{1}$ ✓

$2 = 2 \neq 7$ ✓

$\therefore$ Inconsistent ✓

2. $\begin{cases} x - 2y = 9 \\ x + 3y = 14 \end{cases}$

$\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ✓

$\dfrac{1}{1} = \dfrac{-2}{3} = \dfrac{9}{14}$ ✓

$1 \neq -\dfrac{2}{3} \neq \dfrac{9}{14}$ ✓

$\therefore$ Consistent and independent ✓

3. $\begin{cases} x + 3y = 8 \\ x - 3y = 8 \end{cases}$

$\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ✓

$\dfrac{1}{1} = \dfrac{3}{-3} = \dfrac{8}{8}$ ✓

$1 \neq -1 \neq 1$ ✓

$\therefore$ Consistent and independent ✓

4. $\begin{cases} 2y = 6x - 5 \\ 3y = 9x + 1 \end{cases}$

$\begin{cases} 6x - 2y = 5 \\ 9x - 3y = -1 \end{cases}$

$\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ✓

$\dfrac{6}{9} = \dfrac{-2}{-3} = \dfrac{5}{-1}$ ✓

$\dfrac{2}{3} = \dfrac{2}{3} \neq -5$ ✓

$\therefore$ Inconsistent ✓

5. $\begin{cases} 3x + 5y = 15 \\ 4x - 7y = 10 \end{cases}$

$\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} = \dfrac{c_1}{c_2}$ ✓

$\dfrac{3}{4} = \dfrac{5}{-7} = \dfrac{15}{10}$ ✓

$\dfrac{3}{4} \neq -\dfrac{5}{7} \neq \dfrac{3}{2}$ ✓

$\therefore$ Consistent and independent ✓