Activity 1.8.2: Categorizing Systems of Linear Equations in Two Variables

Total points = 21

Answers

 $\begin{cases} 8x + 2y = 7 \\ y = -4x + 1 \end{cases}$ $1 \neq -1 \neq 1 \checkmark$... Consistent and indepen- $\int 8x + 2y = 7$

4x + y = 1 $4. \begin{cases} 2y = 6x - 5 \\ 3y = 9x + 1 \end{cases}$ $\begin{cases} 6x - 2y &= 5\\ 9x - 3y &= -1 \end{cases}$ ∴ Inconsistent 🗸 $\mathbf{2.} \ \left\{ \begin{array}{lcl} x - 2y & = & 9 \\ x + 3y & = & 14 \end{array} \right.$

 $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \checkmark$ $\frac{1}{1} = \frac{-2}{3} = \frac{9}{14} \checkmark$ $1 \neq -\frac{2}{3} \neq \frac{9}{14} \checkmark$ $\therefore \text{ Consistent and independent} \checkmark$ 5. $\begin{cases} 3x + 5y &= 15 \\ 4x - 7y &= 10 \end{cases}$ $3. \begin{cases} x+3y = 8 \\ x-3y = 8 \end{cases}$ Consistent and indepen-

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

 $\begin{cases} x - 2y &= 9 \\ x + 3y &= 14 \end{cases}$: Consistent and indepen- $3. \left\{ \begin{array}{lcl} x + 3y & = & 8 \\ x - 3y & = & 8 \end{array} \right.$

4. $\begin{cases} 2y = 6x - 5 \\ 3y = 9x + 1 \end{cases}$ $\begin{cases} 6x - 2y = 5 \\ 9x - 3y = -1 \end{cases}$ 5. $\begin{cases} 3x + 5y = 15 \\ 4x - 7y = 10 \end{cases}$

. Consistent and indepen-

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 $1 \neq -1 \neq 1 \checkmark$

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Answers

 $\begin{cases} 8x + 2y = 7 \\ y = -4x + 1 \end{cases}$ $1 \neq -1 \neq 1$ ✓ ∴ Consistent and indepen- $\int 8x + 2y = 7$

 $\int 4x + y = 1 \checkmark$ 4. $\begin{cases} 2y &= 6x - 5 \\ 3y &= 9x + 1 \end{cases}$ $\begin{cases} 6x - 2y &= 5 \\ 9x - 3y &= -1 \end{cases}$ $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \checkmark$ $\frac{8}{4} = \frac{2}{1} = \frac{7}{1} \checkmark$ $2 = 2 \neq 7 \checkmark$ ∴ Inconsistent 🗸 $\mathbf{2.} \ \left\{ \begin{array}{lcl} x-2y & = & 9 \\ x+3y & = & 14 \end{array} \right.$ Inconsistent 🗸

5. $\begin{cases} 3x + 5y &= 15 \\ 4x - 7y &= 10 \end{cases}$ ∴ Consistent and indepen-3. $\begin{cases} x + 3y &= 8 \\ x - 3y &= 8 \end{cases}$ Consistent and indepen-

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

 $\int 8x + 2y = 7$ $\int 4x + y = 1 \checkmark$

 $1 \neq -1 \neq 1$ \checkmark Consistent and indepen-

4. $\begin{cases} 2y = 6x - 5 \\ 3y = 9x + 1 \\ 6x - 2y = 5 \\ 9x - 3y = -1 \end{cases}$ $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \checkmark$ $\frac{6}{9} = \frac{-2}{-3} = \frac{5}{-1} \checkmark$ $\frac{2}{3} = \frac{2}{3} \neq -5 \checkmark$ Inconsistent ∴ Inconsistent 🗸 $\left\{ \begin{array}{lcl} x-2y & = & 9 \\ x+3y & = & 14 \end{array} \right.$

∴ Consistent and indepen-

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

∴ Inconsistent
$$\checkmark$$

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

$$1 - \frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \checkmark$$

$$\frac{3}{4} = \frac{5}{-7} = \frac{15}{10} \checkmark$$

$$\frac{3}{4} \neq -\frac{5}{7} \neq \frac{3}{2} \checkmark$$
∴ Consistent and independent \checkmark