



Inconsistent System of Linear Equations

• Example 1

Find the constant k such that the system of linear equations below has no solution.

$$\begin{aligned}2x + 3y &= 10 \\ -kx + 12y &= 7\end{aligned}$$

To eliminate the y variable, multiply through the first equation by -4 and add the resulting equations.

$$\begin{array}{r} -8x - 12y = -40 \\ \underline{-kx + 12y = 7} \\ (-8 - k)x \qquad = -33 \end{array}$$

A real solution for x can be obtained in the last equation so long as $k \neq -8$. No solution exists and the system is inconsistent if $k = -8$.

● ● ● CHECK YOURSELF 1

Find the constant k such that the system of linear equations below has no solution.

$$\begin{aligned}-10x - y &= 3 \\ kx + 5y &= -13\end{aligned}$$

● ● ● CHECK YOURSELF ANSWER

1. $k = 50$.

2.32 Exercises

Name _____

Section _____

Date _____

A N S W E R S

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

For each of the systems of linear equations below, find the constant k such that the system has no solution.

$$\begin{aligned} 1. \quad kx - 8y &= -6 \\ 5x + 2y &= 6 \end{aligned}$$

$$\begin{aligned} 2. \quad -7x + ky &= 12 \\ x - 9y &= -1 \end{aligned}$$

$$\begin{aligned} 3. \quad 7x - 10y &= -44 \\ 28x - ky &= 19 \end{aligned}$$

$$\begin{aligned} 4. \quad 2x - ky &= 12 \\ 3x + y &= -6 \end{aligned}$$

$$\begin{aligned} 5. \quad -13x + 12y &= 106 \\ -kx - 32y &= -74 \end{aligned}$$

$$\begin{aligned} 6. \quad \frac{k}{2}x - y &= 8 \\ -x + 13y &= -42 \end{aligned}$$