

2.32

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.

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

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.

1. $kx - 8y = -6$
 $5x + 2y = 6$

2. $-7x + ky = 12$
 $x - 9y = -1$

3. $7x - 10y = -44$
 $28x - ky = 19$

4. $2x - ky = 12$
 $3x + y = -6$

5. $-13x + 12y = 106$
 $-kx - 32y = -74$

6. $\frac{k}{2}x - y = 8$
 $-x + 13y = -42$