



4-5 Study Guide and Intervention

Graphing Linear Equations

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Read!

Identify Linear Equations A **linear equation** is an equation that can be written in the form $Ax + By = C$. This is called the **standard form** of a linear equation.

Standard Form of a Linear Equation

$Ax + By = C$, where $A \geq 0$, A and B are not both zero, and A , B , and C are integers whose GCF is 1.

Example 1

Determine whether $y = 6 - 3x$ is a linear equation. If so, write the equation in standard form.

First rewrite the equation so both variables are on the same side of the equation.

$$\begin{array}{ll} y = 6 - 3x & \text{Original equation} \\ y + 3x = 6 - 3x + 3x & \text{Add } 3x \text{ to each side.} \\ 3x + y = 6 & \text{Simplify.} \end{array}$$

The equation is now in standard form, with $A = 3$, $B = 1$ and $C = 6$. This is a linear equation.

Example 2

Determine whether $3xy + y = 4 + 2x$ is a linear equation. If so, write the equation in standard form.

Since the term $3xy$ has two variables, the equation cannot be written in the form $Ax + By = C$. Therefore, this is not a linear equation.

Exercises

Determine whether each equation is a linear equation. If so, write the equation in standard form. If not, state why it is not a linear equation.

1. $2x = 4y$

2. $6 + y = 8$

3. $4x - 2y = -1$

4. $3xy + 8 = 4y$

5. $3x - 4 = 12$

6. $y = x^2 + 7$

7. $y - 4x = 9$

8. $x + 8 = 0$

9. $-2x + 3 = 4y$

10. $2 + \frac{1}{2}x = y$

11. $\frac{1}{4}y = 12 - 4x$

12. $3xy - y = 8$

13. $6x + 4y - 3 = 0$

14. $yx - 2 = 8$

15. $6a - 2b = 8 + b$

16. $\frac{1}{4}x - 12y = 1$

17. $3 + x + x^2 = 0$

18. $x^2 = 2xy$