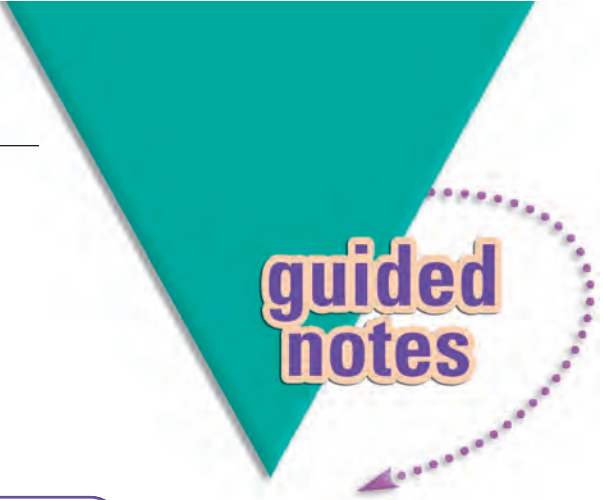


NAME _____

Module 8 Writing Linear Equations of Two Variables
Lesson 4 Solving Linear Equations in Two Variables When Parameters Are Changed



guided notes

Lesson Objectives

- Transform an equation into slope-intercept form when it is given in standard form.
- Graph an equation given in standard form.
- Identify the effects of parameter changes on the appearance of graphs.

The **parameters** _____ in the equation $y = mx + b$ are **m** _____ and **b** _____.

Changing the parameter b moves a line up or down the **y -axis** _____ without changing its slope.

Changing the value of the parameter m affects the **steepness** _____ and **direction** _____ of a line.

Changing the parameter m to its opposite reciprocal creates a line perpendicular to the original line with the same y -intercept.

For problems 1-3, graph the equations on a coordinate plane. Use a separate sheet of grid paper.

1 Given $y = -\frac{1}{4}x - 2$, determine the resulting equation when the y -intercept is increased by six. Compare the graphs.

Equation: $y = -\frac{1}{4}x - 2$ becomes $y = -\frac{1}{4}x + 4$

Graph: The line is translated up 6 units.

2 Given $y = -\frac{1}{4}x - 2$, determine the resulting equation when the slope is multiplied by -16 . Compare the graphs.

Equation: $y = -\frac{1}{4}x - 2$ becomes $y = 4x - 2$

Graph: The lines are perpendicular with the same y -intercept.

- 3 Given $y = 3x - 4$, determine the resulting equation when the slope is divided by -6 . Compare the graphs.

Equation: $y = 3x - 4$ becomes $y = -\frac{1}{2}x - 4$

Graph: The lines have the same y -intercept but different slopes.

Slope-intercept form, point-slope form, and **standard form** are three forms a linear equation can take.

Standard form of a linear equation is $Ax + By = C$, where **A** and **B** cannot both be **zero**.

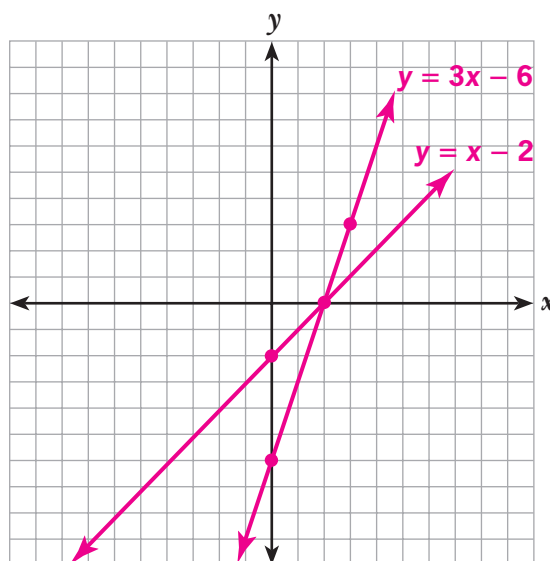
Slope-intercept form of a linear equation is $y = mx + b$.

To convert a linear equation from standard form to slope-intercept form, solve it for **y**, and write in the form $y = mx + b$.

- 4 Graph the line $3x - y = 6$. Find an equation of the line whose slope is one-third the slope of the given line and whose y -intercept is four more than the y -intercept of the given line.

Graph the new line and compare the graphs.

The new line is less steep than the given line and intersects the y -axis four units above the given line.



Linear Equations

- **Slope-Intercept** Form: $y = mx + b$
- Point-Slope Form: $y - y_1 = m(x - x_1)$
- Standard Form: $Ax + By = C$, where **A** and **B** cannot both be zero