Investigating $y = mx + b$

You can use a graphing calculator to explore the graph of an equation in the form $y = mx + b$. For this activity, use a standard screen by pressing ZOOM 6.

Go Online
PHSchool.com

For: Graphing calculator procedures
Web Code: ate-2104

1. Graph these equations on the same screen. Then complete each statement.

$$y = x + 1 \qquad y = 2x + 1 \qquad y = \tfrac{1}{2}x + 1$$

  a. The graph of __?__ is closest to the y-axis.
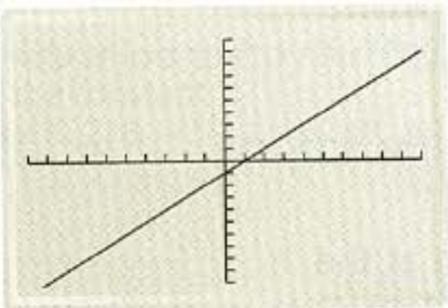 **b.** The graph of __?__ is closest to the x-axis.

2. Match each equation with the best choice for its graph.
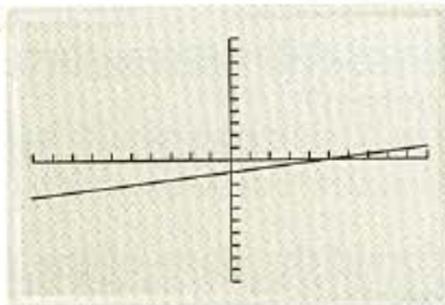 **A.** $y = \tfrac{1}{5}x - 1$ **B.** $y = 5x - 1$ **C.** $y = x - 1$
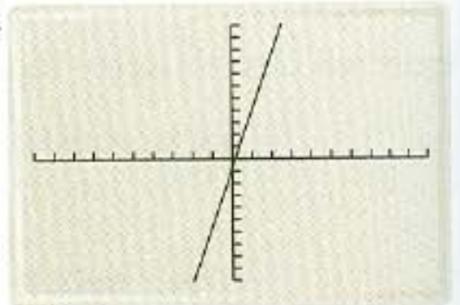
  I.   **II.**   **III.**

3. How does changing m affect the graph of an equation in the form $y = mx + b$?

4. Graph these equations on the same screen.

$$y = 2x + 1 \qquad y = -2x + 1$$

How does the sign of m affect the graph of an equation?

5. Graph these equations on the same screen.

$$y = 2x + 1 \qquad y = 2x - 2 \qquad y = 2x + 2$$

Where does the graph of each equation cross the y-axis? (*Hint:* Use the ZOOM feature to better see the points of intersection.)
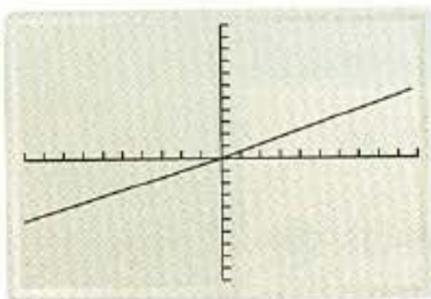
6. Match each equation with the best choice for its graph.
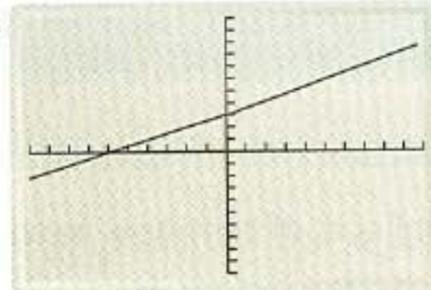 **A.** $y = \tfrac{1}{2}x - 5$ **B.** $y = \tfrac{1}{2}x$ **C.** $y = \tfrac{1}{2}x + 3$
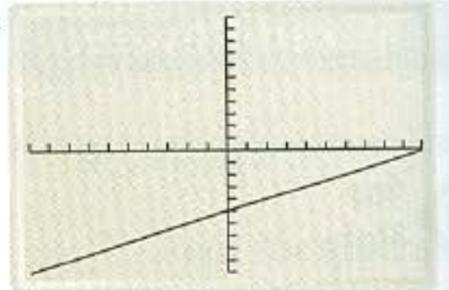
  I.   **II.**   **III.**

7. How does changing the value of b affect the graph of an equation in the form $y = mx + b$?

8. You can change the appearance of a graph by changing its scale in the WINDOW screen. Describe how the graph of $y = 2x + 1$ changes from its appearance on a standard screen using the following values for Xmin, Xmax, Ymin, and Ymax.

  a. Xmin = –5 Ymin = –10
     Xmax = 5 Ymax = 10

  b. Xmin = –10 Ymin = –5
     Xmax = 10 Ymax = 5