



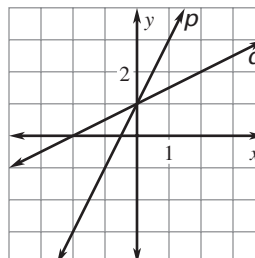
Objective 3 TEKS A.6.C Review

A.6.C Investigate, describe, and predict the effects of changes in m and b on the graph of $y = mx + b$.

The graph of a linear function can be written in the form $y = mx + b$, where m is the **slope** and b is the **y-intercept**.

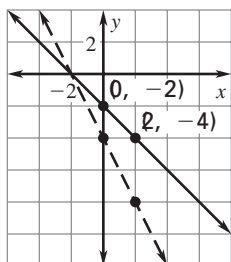
As $|m|$ increases, the graph rises or falls more steeply.

Because the slope of line p is greater than the slope of line q , line p is steeper than line q .



EXAMPLE

The graph of $y = -x - 2$ passes through the point $(2, -4)$. If we double both the slope of this line and its y -intercept, the graph of the new line will pass through the point $(2, y)$. What is the value of y ? How is the graph affected by doubling the slope and the y -intercept?



The slope of the graph of $y = -x - 2$ is -1 . Therefore, the slope of the new line is $2(-1)$ or -2 .

The y -intercept of the new line is $2(-2)$ or -4 .

The equation of the new line is $y = -2x - 4$.

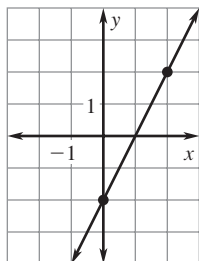
On the graph of $y = -2x - 4$ if $x = 2$, then $y = -2(2) - 4 = -8$.

The new line will pass through $(2, -8)$, so $y = -8$.

Because the slope of the new line is doubled, the new line is steeper than the original line. Doubling the y -intercept moves the graph down 2 units.

YOU DO IT

The graph of $y = 2x - 2$ passes through the point $(2, 2)$. If we divide the slope in half, the graph of the new line will pass through the point $(2, y)$. What is the value of y ? Is the new line less steep or more steep than the original line?



The slope of the graph of $y = 2x - 2$ is 2. Therefore, the slope of the new line is $\frac{1}{2}(\underline{2})$ or $\underline{1}$.

What is the y -intercept of the new line? $\underline{-2}$

The equation of the new line is $\underline{y = x - 2}$.

On the graph of $y = x - 2$ if $x = 2$, then $y = \underline{2} - 2 = \underline{0}$.

The new line will pass through $(2, \underline{0})$, so $y = \underline{0}$.

The new line is **less steep than the original line**.

