
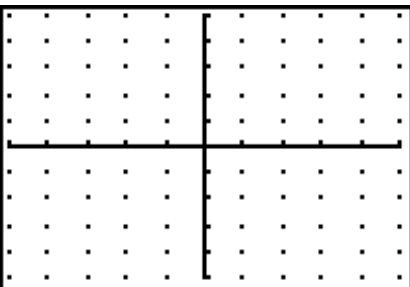
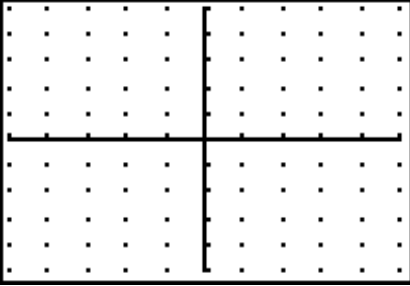
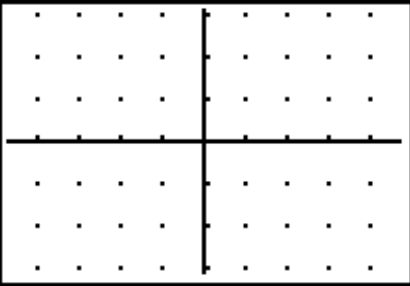


Studying the Graphical Effects of M

Directions: In this lesson you will study how the coefficient of the x term effects the graph of the line. The first entry has been completed for you.

Part I: Complete the table and then answer questions 1-7 on your answer document

| Problem | Function | Value of slope "m" | What is the graphical meaning of the slope? | Is the graph steeper, flatter, or the same as the graph of $y = x$? | Sketch of the graph Trace along the graph and label two coordinates on the graph. The window is a zoom 6. Integer window with $x scl = y scl = 10$ |
|---------|---------------------------|--------------------|---|--|---|
| 1 | $y = x$ or $y = 1x$ | 1 | For every change of 1 in the vertical direction y the x changes by 1. | | |
| 2 | $y = 2x$ | | | | |
| 3 | $y = 3x$ | | | | |

| | | | | | |
|---|--------------------------|--|--|--|---|
| 4 | $y = (3/2)x$ | | | |  |
| 5 | $y = (5/2)x$ | | | |  |
| 6 | $y = -x$ or $y = -1x$ | | | |  |
| 7 | $y = -2x$ | | | |  |

| | | | | | |
|----|-------------|--|--|--|--|
| 8 | $y = -3x$ | | | | |
| 9 | $y = -1.5x$ | | | | |
| 10 | $y = -2.5x$ | | | | |

1. What point does every graph have in common? (____, ____)
2. Graphs 1-5 are different from graphs 6-10. When the m , the coefficient of x , is positive which way does the line point?

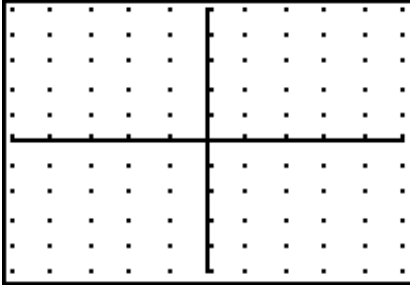
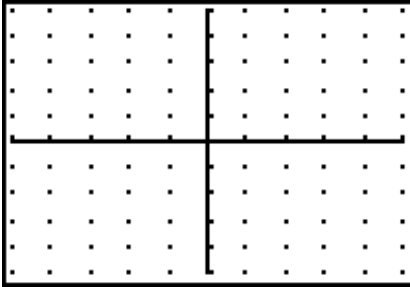

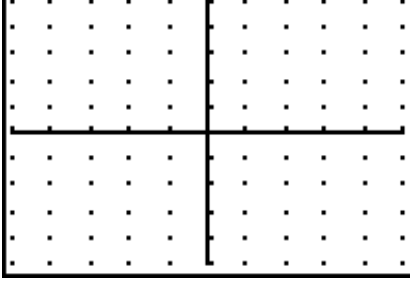
When m , the coefficient of x , is negative which way does the line point?

4. When m is positive which two quadrants does the line appear?

When m is negative which two quadrants does the line appear?

5. As the m value, the coefficient of x , got larger how did the line change?
6. As the m value, the coefficient of x , got smaller negatively, how did the line change?
7. Predict how the line will change if the slope, m , is between 0 and 1.

Enter several equation in your calculator and verify your prediction. Complete the table below for four examples

| Problem | Function | Value of slope "m" | What is the graphical meaning of the slope? | Is the graph steeper, flatter, or the same as the graph of $y = x$? | Sketch of the graph Trace along the graph and label two coordinates on the graph. |
|---------|----------|--------------------|---|--|---|
| 11 | | | For every change of y in the vertical direction the x changes by 1. | |  |
| 12 | | | | |  |
| 13 | | | | |  |
| 14 | | | | |  |

8. How did the line change as the slope, m , got closer to zero?

9. Predict how the line will change if the slope, m , is 0.

As the value of m changed, did the location of the y -intercept ever change?
Explain.

10. Study the coordinates you labeled on each graph. How do these coordinates reflect the equation the lines represents?

11. Write a sentence that describes your understanding of the value of m in graphing the equation.

12. For each of the following, write an equation of a line that fits the characteristics. Verify your answer with the calculator.

| Condition to be met | Equation | Example of a coordinate on this line |
|--|----------|--------------------------------------|
| A line steeper than $y = 3x$. | | |
| A line flatter than $y = -(1/2)x$. | | |
| A line that lies between the graphs of $y = 1.5x$ and $y = (1/2)x$. | | |