Activity 1 Date $\qquad$ Per ----

## Graphing Lines of the Form $\boldsymbol{y}=\boldsymbol{m x}$

Objective: In this lesson you will see how the value of $m$ affects the graph of a straight line.

1. Use the graphing calculator to graph each function and complete the table. An example is done for you.

| Function | Value of $m$ | Sketch | $x$-intercept | $y$-intercept | Is the graph the same, steeper, or flatter than the graph of $y=x($ or $y=-x) ?$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $y=x$ | 1 |  | $(0,0)$ | $(0,0)$ | The same as $y=x$. |
| $y=-x$ |  |  |  |  |  |
| $y=2 x$ |  |  |  |  |  |
| $y=-2 x$ |  |  |  |  |  |
| $y=0.5 x$ |  |  |  |  |  |

Exploring Linear Equations

| Function | Value <br> of $m$ | Sketch | x-intercept | $y$-interceptIs the graph the same, steeper, <br> or flatter than the graph <br> of $y=x$ (or $y=-x) ?$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- |
| $y=-8 x$ |  |  |  |  |  |
| $y=-0.4 x$ |  |  |  |  |  |
| $y=0.05 x$ |  |  |  |  |  |

2. Use the results to answer the following items.
a. What point does every graph in exercise 1 have in common?
b. Does the value of $m$ affect the location of the $x$ - or $y$-intercept?
c. If the graph lies in quadrants I and III, then $m$ is (positive, negative). Circle one answer
d. If the graph lies in quadrants II and IV, then $m$ is (positive, negative). Circle one answer
$e$. If $m$ is positive, predict what will happen to the graph as $m$ gets larger. $\qquad$
f. If $m$ is negative, predict what will happen to the graph as $I m I$ (absolute value of $m$ ) increases.
g. Make a conjecture about the graph when $m=0$.

Check your prediction by graphing the function on your calculator.
h. Summarize the role of $m$ in the graph of $y=m x$.

