Mathematics 9
Linear Relations: Slope

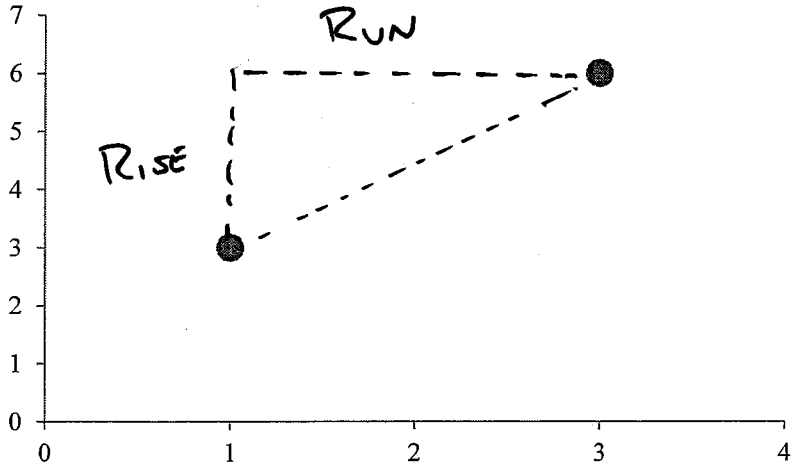
Remember that when we deal with linear relations we are dealing only with STRAIGHT lines. While all the lines are straight, they will not all appear the same. The steepness of the line can vary question by question. This change in steepness is referred to as the SLOPE of the line.

Slope must ALWAYS be thought of as a FRACTION, and the movement between two coordinates as steps. These steps are broken down as follows:

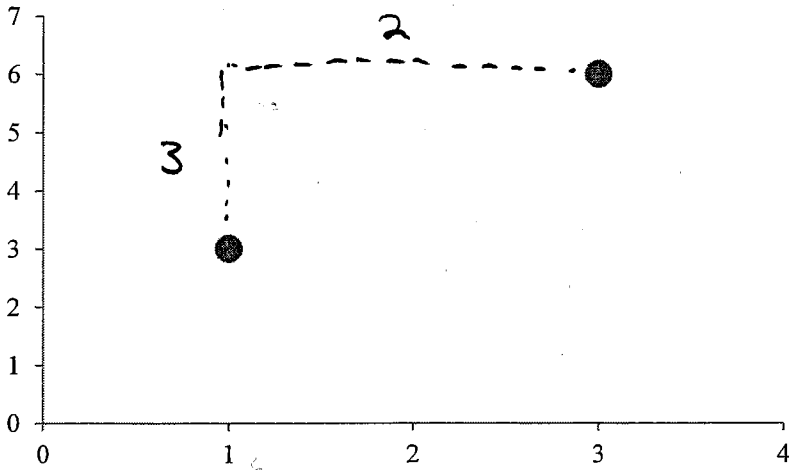
$\text{SLOPE} = \frac{\text{RISE}}{\text{RUN}}$

RISE - THE DISTANCE MOVED UP/DOWN

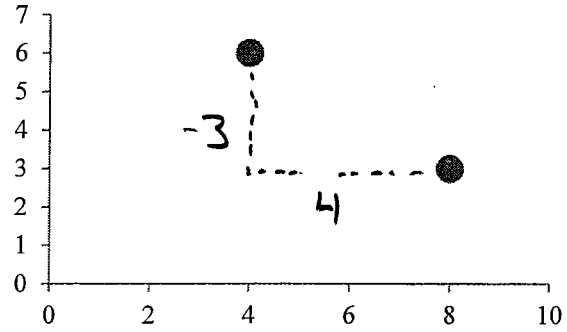
RUN - THE DISTANCE MOVED LEFT/RIGHT



So a slope of $\frac{3}{2}$ would mean between each point you would take 3 STEPS UP and 2 STEPS RIGHT.



A slope of $\frac{-3}{4}$ or $\frac{-3}{4}$ would mean between each point you would take 3 STEPS DOWN and 4 STEPS RIGHT. (Remember! The negative sign only applies to ONE number at a time!!)



Once you have the trend of the line, you can continue it in the opposite direction.
A MINIMUM OF 3 POINTS ARE NEEDED WHEN DRAWING A GRAPH.

What about a slope of $\frac{4}{1}$? How do we explain this slope as a fraction?

$$\text{SLOPE} = \frac{\text{RISE}}{\text{RUN}} = \frac{4}{1}$$ SO UP 4 & RIGHT 1

What about a slope of -3?

$$\text{SLOPE} = \frac{\text{RISE}}{\text{RUN}} = -\frac{3}{1} \text{ OR } \frac{-3}{1}$$ DOWN 3, LEFT 1

What about a slope of $\frac{4}{6}$? SLOPE MUST ALWAYS BE SHOWN IN SIMPLEST TERMS.

$$\text{SLOPE} = \frac{4}{6} = \frac{2}{3}$$

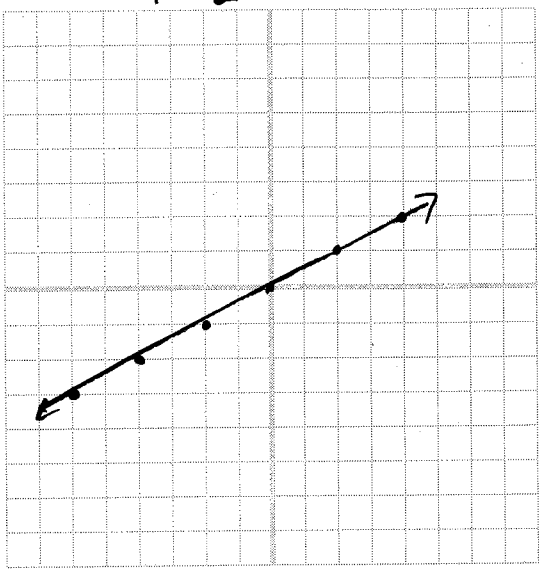
The slope of a line is ALWAYS WRITTEN IN FRONT OF THE VARIABLE x.

Practice: use the 6 grid/page sheet to graph these lines.

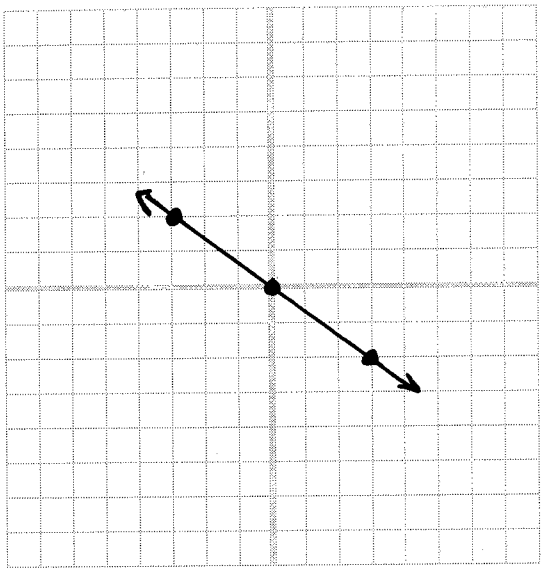
1) $y = \frac{1}{2}x$
2) $y = -\frac{2}{3}x$
3) $y = 3x$
4) $y = -2x$
5) $y = -\frac{3}{2}x$
6) $y = \frac{4}{3}x$
7) $y = \frac{3}{4}x$
8) $y = \frac{2}{3}x$
9) $y = x$
10) $y = -x$
11) $y = 4x$
12) $y = -\frac{1}{4}x$

Textbook: Pg. 188, #3, 4

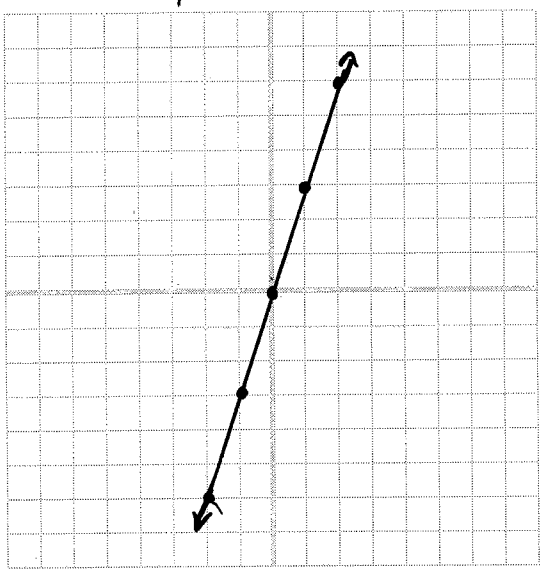
① $y = \frac{1}{2}x$



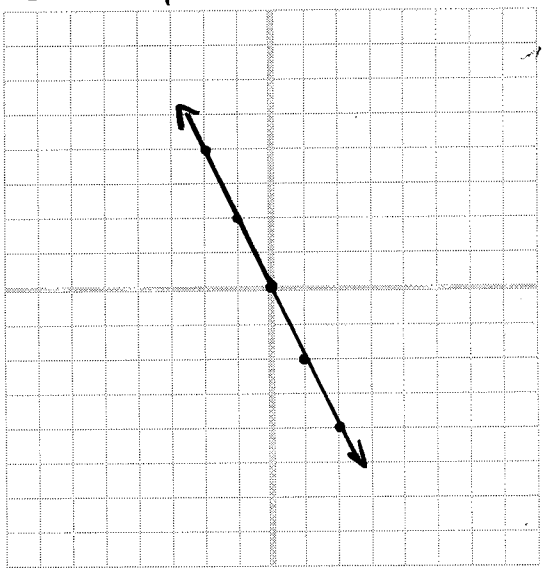
② $y = -\frac{2}{3}x$



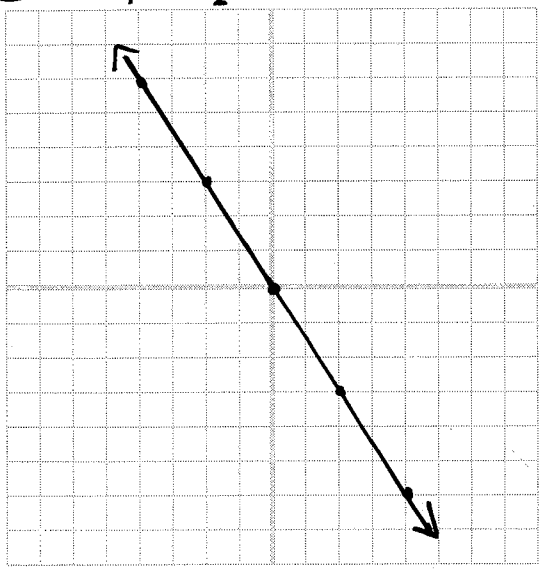
③ $y = 3x$



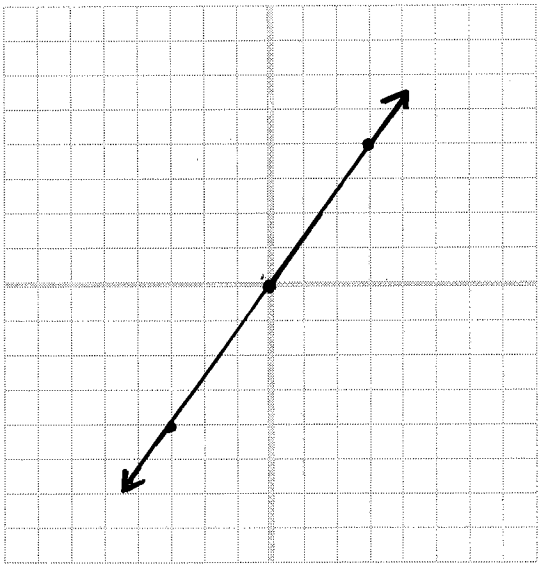
④ $y = -2x$



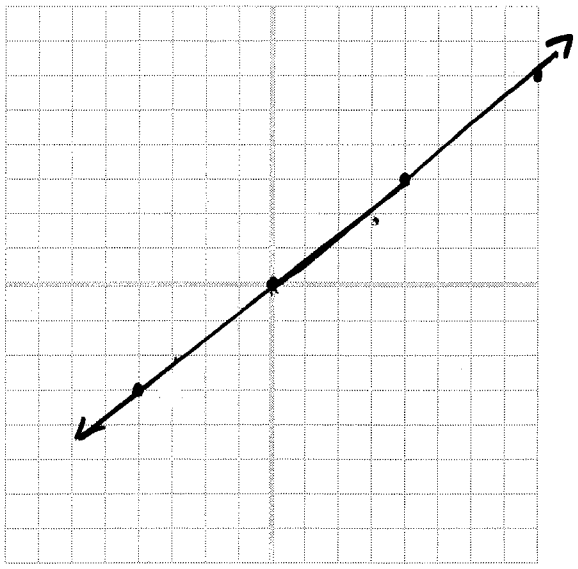
⑤ $y = -\frac{3}{2}x$



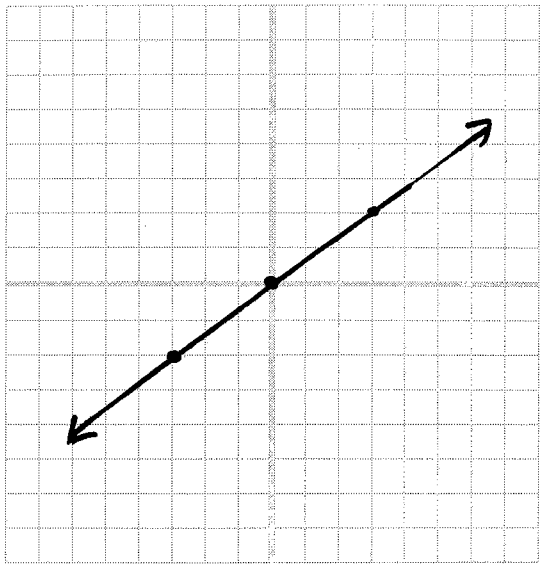
⑥ $y = \frac{4}{3}x$



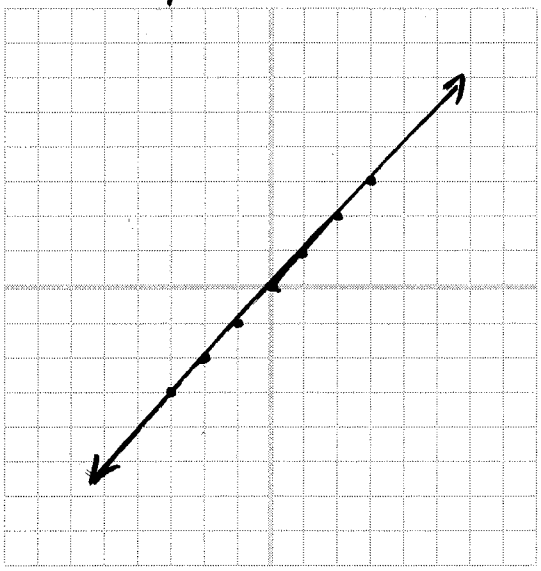
(7) $y = \frac{3}{4}x$



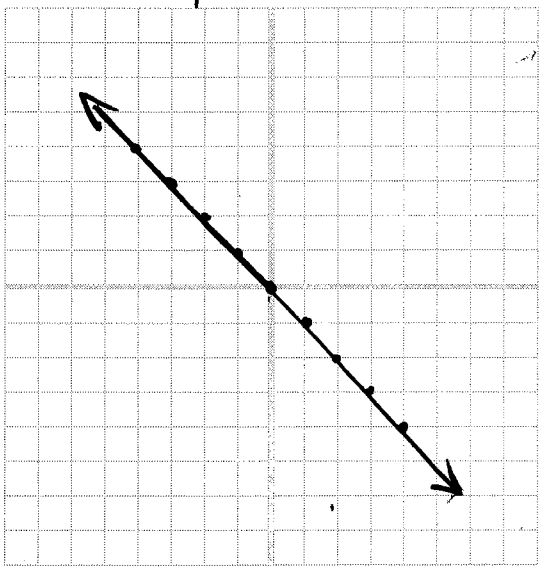
(8) $y = \frac{2}{3}x$



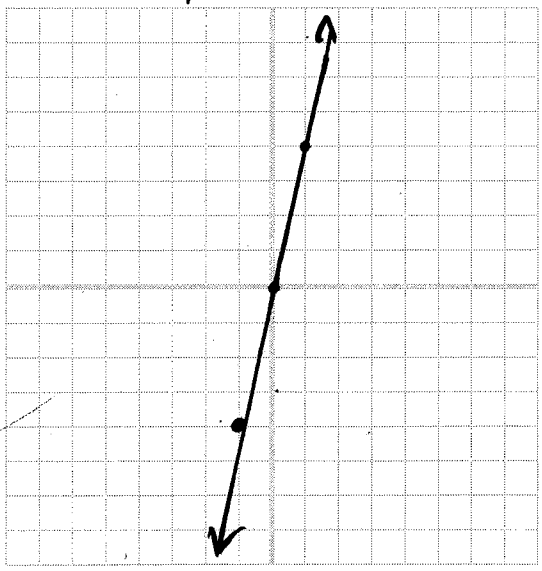
(9) $y = x$



(10) $y = -x$



(11) $y = 4x$



(12) $y = -\frac{1}{4}x$