Slope, Part 3

Slope can also be found from a table of values of a linear function. In that case, it is the same concept as the rate of change that you are already familiar with.

Example 1. The table gives values for a linear function.

x	−4	−3	−2	−1	0	1	2
y	13	11	8	7	5	3	1

Looking for patterns in the x-values and in the y-values, it is easy to see that as the x-coordinates increase by one, the y-coordinates *decrease* by 2.

This means the slope is $\frac{\text{change in } y\text{-values}}{\text{change in } x\text{-values}} = \frac{-2}{1} = \mathbf{-2}$.

We will get the same by calculating the slope from any two points given in the table. For example, using the points (−3, 11) and (1, 3), we can see that the y-value decreases by 8, as the x-value increases by 4.

So, the slope is $\frac{\text{change in } y\text{-values}}{\text{change in } x\text{-values}} = \frac{-8}{4} = -2$.

1. Determine the slope of each line from the table of values. You can check your work by graphing.

a.

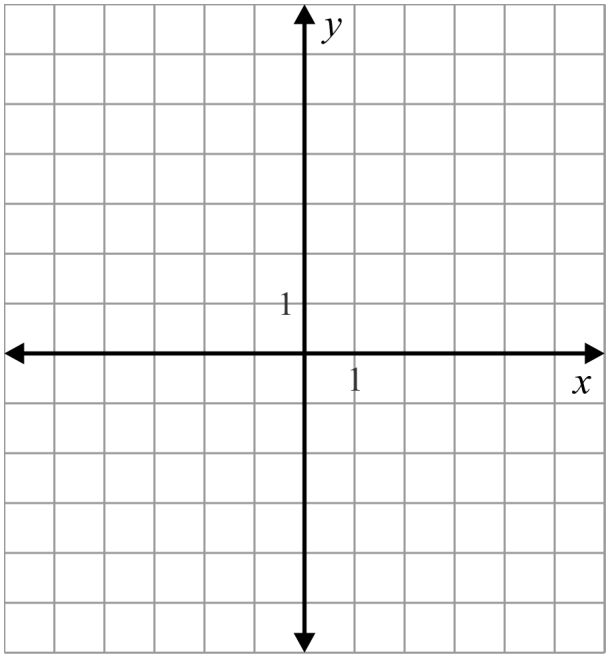
x	−3	−2	−1	0	1	2	3
y	−3.5	−2	−0.5	1	2.5	4	5.5

b.

x	−3	−2	−1	0	1	2	3
y	2	0	−2	−4	−6	−8	−10

c.

x	−4	−2	0	2	4	6	8
y	5	4	3	2	1	0	−1



2. Find the slope of the line that goes through the points (−2, −3) and (0, 2).

3. Enrique calculated the slope of a line that goes through points (−4, 6) and (−2, 1) as follows:

$$\text{slope} = \frac{1-6}{(-4)-(-2)} = \frac{-5}{-2} = 2\ ½$$

Find the error in his calculation.

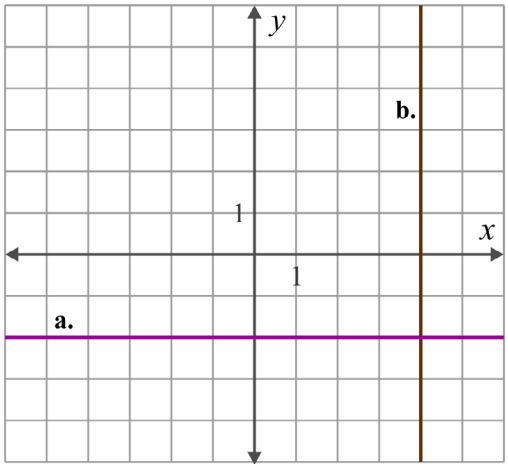
- A **horizontal line** has a **slope of zero.**
- A **vertical line** has **no slope.**

4. **a.** Draw any two points on the horizontal line in the image.

   Now, calculate the slope using the coordinates of those points (change in *y*-values/change in *x*-values). What do you get?

   b. Draw any two points on the vertical line in the image.

   Now, *try* to calculate the slope using the coordinates of those points. What happens?



5. Find the slope of the line that goes through the given points. Also, graph the lines.

   a. (−3, 5) and (4, 5)

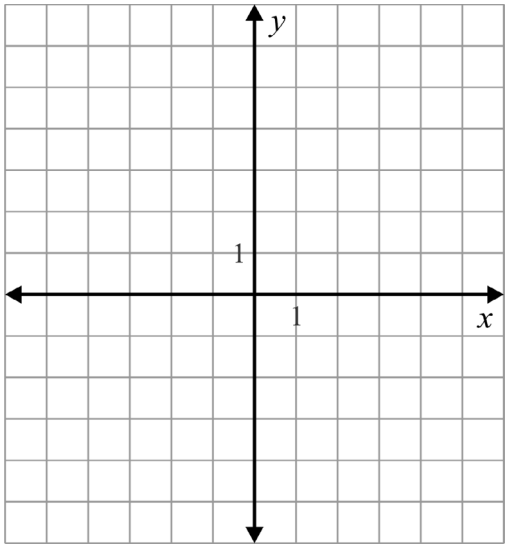
   Slope:

   b. (−2, 6) and (3, −4)

   Slope:

   c. (−5, 2) and (−5, −1)

   Slope:



6. Determine the slope of each line. Notice carefully the scaling of the grids — it is not the same for each axis, but the way to find the slope is the same: rise over run.