

# Slope & y-Intercept Worksheet

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Names \_\_\_\_\_

## Preliminary Setup:

Turn [ON] the calculator (located on the bottom left of the calculator)

Press [2nd] then [+] for mem

Select the Reset option (on TI82's #3 and on TI83's #2) followed by option #2 (on TI82's Reset and on TI83's Default) now on TI83's select option #2: Reset

Turn the calculator OFF by selecting [2nd] then [ON]

Turn the calculator [ON] If you do not see anything on the screen tell your teacher.

Press [WINDOW] and change the Xmin = -10 to **Xmin = -8.8**

## I. Slopes

A) Graph:  $y = 2x + 3$  and  $y = 2x$  and  $y = 2x - 5$

Step 1: Press [Y=] and enter the above after  $Y_1$ ,  $Y_2$ , and  $Y_3$

Step 2: Press [GRAPH]

1) Just by looking at the graphs are the slopes of these three lines the same? (yes or no) 1) \_\_\_\_\_

Step 3: Press [TRACE] to find points on the top line  $y = 2x + 3$

Step 4: Press the [right arrow] until the  $x$  at the bottom equals 2 and the  $y$  equals 7.

Step 5: Now press the [right arrow] until the  $x$  at the bottom equals 3.

2) Answer: 2) When  $x = 3$  then  $y =$  \_\_\_\_\_

3) To find the slope of the line  $y = 2x + 3$  we can use the formula  $m = \frac{y_2 - y_1}{x_2 - x_1}$  where  $m = \frac{9 - 7}{3 - 2}$

(Note: The numbers 3 and 9 are from step 5 and the numbers 2 and 7 are from step 4.)

Answer:  $m = \frac{9 - 7}{3 - 2} = ?$  3) \_\_\_\_\_

Look at the *equation* and the answer for the *slope*. Mentally find a relationship between the equation  $y = 2x + 3$  and the slope answer from #3) above. In other words, the answer from #3) above should be the same as one of the numbers in the equation  $y = 2x + 3$ ; note the location in the equation where it is found.

B) Graph:  $y = 3x + 4$  and  $y = 3x$  and  $y = 3x - 5$

Step 1: Press [Y=] and enter the above after  $Y_1$ ,  $Y_2$ , and  $Y_3$

Step 2: Press [GRAPH]

1) Just by looking at the graphs are the slopes of these three lines the same? (yes or no) 1) \_\_\_\_\_

Step 3: Press [TRACE] and then the [down arrow] twice to find points on the bottom line  $y = 3x - 5$

Step 4: Press the [right arrow] until the  $x$  at the bottom equals 1 and the  $y$  equals -2.

Step 5: Now press the [right arrow] until the  $x$  at the bottom equals 3.

2) Answer: 2) When  $x = 3$  then  $y =$  \_\_\_\_\_

3) To find the slope of the line  $y = 3x - 5$  we can use the formula  $m = \frac{y_2 - y_1}{x_2 - x_1}$  :

(Note: Use the numbers from step 5 and the numbers (1, -2) from step 4.)

Answer:  $m = \frac{4 - -2}{? - ?} = ?$  3) \_\_\_\_\_

Look at the *equation* and the answer for the *slope*. Mentally find a relationship between the equation  $y = 3x - 5$  and the slope answer from #3) above. In other words, the answer from #3) above should be the same as one of the numbers in the equation  $y = 3x - 5$ ; note the location in the equation where it is found.

**Summary:** Based on the answers to A) and B) if an equation is  $y = ax + b$  then what is the slope? \_\_\_\_\_

over

**II. y-intercepts:** The y-intercept is where the graph crosses the y-axis which is when  $x = 0$ .

- A) Graph:  $y = 3x + 4$  and  $y = 3x$  and  $y = 3x - 5$  (Note: They should already be there from I. B)  
 Step 1: Press [Y=] and enter the above after  $Y_1$ ,  $Y_2$ , and  $Y_3$  (if they are not already there)  
 Step 2: Press [GRAPH]  
 Step 3: Press [TRACE] to find points on the top line  $y = 3x + 4$   
 Step 4: Press the [left arrow] until the  $x$  at the bottom equals 0. This  $y$  value is the y-intercept.  
 1) Answer: \_\_\_\_\_ 1) When  $x = 0$  then  $y =$  \_\_\_\_\_  
 Look at the equation  $y = 3x + 4$  and the answer from #1) for the y-intercept. Find a relationship.  
 In other words, the answer from #1) above should be the same as one of the numbers in the equation  $y = 3x + 4$ ; note the location in the equation where it is found.
- B) Step 1: Press the [down arrow] to find points on the middle line  $y = 3x$  ( $y = 3x + 0$ )  
 Step 2: Press the [arrow key], if needed, until the  $x$  at the bottom equals 0 2) When  $x = 0$  then  $y =$  \_\_\_\_\_  
 Look at the equation  $y = 3x + 0$  and the answer from #2) for the y-intercept. Find a relationship.  
 In other words, the answer from #3) above should be the same as one of the numbers in the equation  $y = 3x + 0$ ; note the location in the equation where it is found.
- C) Step 1: Press the [down arrow] to find points on the bottom line  $y = 3x - 5$   
 Step 2: Press the [arrow key], if needed, until the  $x$  at the bottom equals 0 3) When  $x = 0$  then  $y =$  \_\_\_\_\_  
 Look at the equation  $y = 3x - 5$  and the answer from #3) for the y-intercept. Find a relationship.  
 In other words, the answer from #3) above should be the same as one of the numbers in the equation  $y = 3x - 5$ ; note the location in the equation where it is found.

**III. More y-intercepts:**

- A) Graph:  $y = x + 4$  and  $y = 2x + 4$  and  $y = -2x + 4$  and  $y = \frac{-1}{3}x + 4$  Note: the last equation will look like:  
 $Y_4 = (-1/3)x + 4$   
 Step 1: Press [Y=] and enter the above after  $Y_1$ ,  $Y_2$ ,  $Y_3$ , and  $Y_4$   
 Step 2: Press [GRAPH]  
 Step 3: Press [TRACE]  
 Step 4: Press the [left arrow key] until the  $x$  at the bottom equals 0 1) When  $x = 0$  then  $y =$  \_\_\_\_\_  
 Look at the equations and the answer for the y-intercept. Find a relationship.  
 In other words, the answer from #1) above should be the same as one of the numbers in the equations above; note the location in the equations where it is found.

**Summary:** Based on the answers to II. and III., if an equation is  $y = ax + b$  then what is the y-intercept? \_\_\_\_\_

IV. Using the **Summary** from side one and the **Summary** directly above find  
 a) the slope and b) the y-intercept, of the equations below without graphing them.

1)  $y = \frac{1}{5}x - 2$  1) a) \_\_\_\_\_ b) \_\_\_\_\_

2)  $y = -9x + 7$  2) a) \_\_\_\_\_ b) \_\_\_\_\_