

MATH 101

Worksheet on lines

Spring 2010

**NAME:** \_\_\_\_\_

**Section:** \_\_\_\_\_

1. In Frontland the town charges a \$39 fee for water and waste, plus a charge of \$0.125 per cubic foot of water used. Find a formula  $C(x)$  that computes a total water bill if  $x$  cubic feet of water are used.
  
  
  
  
  
  
  
  
  
  
2. Suppose that Jill pays \$49.95 for her cell phone. She gets 300 minutes free, but is charged \$0.15 for each minute above 300. Give a function that computes her bill if she uses  $x$  minutes in a month and  $x \geq 300$ .
  - (a) How much is her bill if she talks 303 minutes?
  
  
  
  
  
  
  
  
  
  
  - (b) How much is her bill if she talks 705 minutes?
  
  
  
  
  
  
  
  
  
  
  - (c) How much is her bill if she talks 205 minutes?

3. Mike bought some tee shirts at \$7 each and some at \$9 each. If he bought  $x$  of the \$7 shirts and  $y$  of the others and spent a total of \$135, then give an equation in  $x$  and  $y$  which relates all the values.

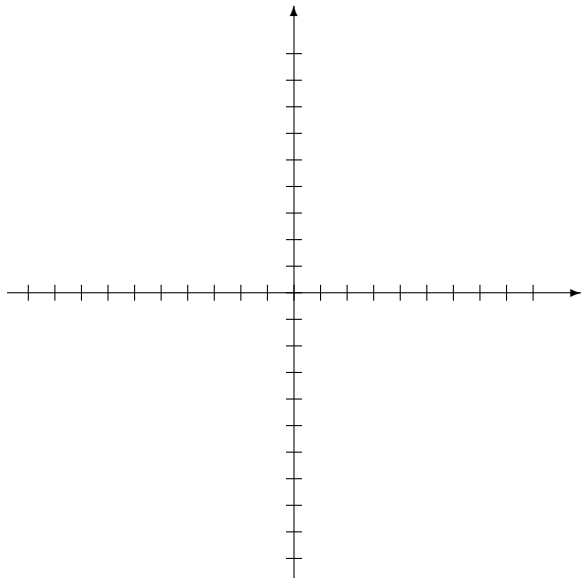
4. Find equations of the form  $y = mx + b$  for each of the following lines.

(a) The line passing through  $(1, -2)$  with slope 3.

(b) The line passing through  $(0, 13)$  with slope  $-2$ .

(c) The line passing through  $(2, 18)$  and  $(6, 2)$ .

5. Graph the lines  $y = 2x + 1$  and  $x + y = 7$  below (label them):



Where do they *appear* to intersect( in whole numbers)? \_\_\_\_\_

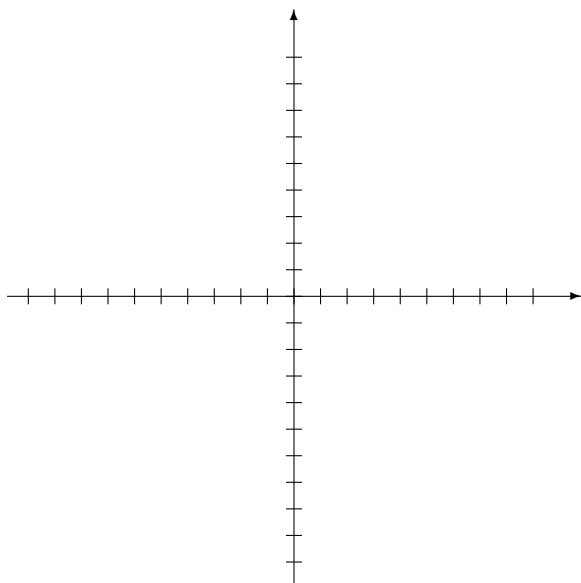
Check and see if the point you chose is actually on BOTH lines.

It doesn't count as wrong if you did not guess the right point.

6. Graph each of the lines

$$2x + y = C$$

for  $C = -2, -1, 0, 1, 2$  and then make a guess as to where the line  $2x + y = -16$  will be in relation to the lines that you have drawn.



7. **The increment property:** Consider the line  $y = 3x + 2$ .

(a) Fill our the folowing table of values:

$x$	$y = 3x + 2$
-2	-4
-1	
0	
1	
2	
3	

(b) In the above table, how much does  $y$  increase when  $x$  is increased by 1

(c) How does this relate to the slope of the line?

(d) If I change  $x$  by 3, then how much would  $y$  change by?

(e) Use the idea above:

Change in  $y =$  (slope) times (change in  $x$ ) to find the  $y$  value when  $x = -5$ ,  
 $x = 5$  and  $x = 12$ .

8. Suppose that the point  $(x_0, y_0)$  is on the line  $y = mx + b$ . If  $x_1 = x_0 + 1$ , then what is the corresponding change in the  $y$  value that we will obtain?

9. A line passes through  $(2, 8)$  and has slope  $m = 5$ . Without finding an equation for the line find

(a) the  $y$  value when  $x = 1$ ,

(b) the  $y$  value when  $x = 3$ ,

(c) the  $y$  value when  $x = 5$ .