



Summer Math Review

Entering 8th Grade Packet

Dear Parents:

I have prepared this optional math packet for our students to complete by gathering information from on-line sources and various schools in an effort to prepare them for a successful school year next year.

This work is not intended to be completed in one sitting, but should be done at a steady pace throughout the course of the summer. I have included an answer key so that the students can check their answers. This packet will NOT be graded, nor will it be collected at the beginning of the year. The packet is just designed to provide students with extra practice that will support them with their retention of the basic mathematical skills which are required for the 7th grade. The students can be assisted during their completion of the packet by anyone, and I encourage dialogue surrounding any tough questions.

I have enjoyed teaching your children this year, and I wish you a very happy, healthy and safe summer!

Enjoy,

Mr. Garry

Websites Used:

<http://www.brrsd.k12.nj.us/>

<http://www.khanacademy.org/>

BIG Ideas Entering Algebra 1

You should be able to:

- A. Apply the order of operations to integer computations.
- B. *Add, subtract, multiply and divide integers.*
- C. *Work with fractions.*
- D. *Simplify algebraic expressions.*
- E. *Solve equations that contain multiple steps (including fractional coefficients).*
- F. *Create algebraic equations from verbal expressions.*
- G. *Evaluate expressions.*
- H. *Find the slope of a line*
- I. *Graph linear equations*
- J. *Solve linear inequalities*

A. You should be able to: Apply the Order of Operations to integer computations. Refer to video tutorials at <http://www.khanacademy.org/>

Evaluate the following expressions without a calculator using Order of Operations. (PEMDAS)

1. $4 \cdot 12 + 8 - 10 \div 5$

2. $8(3+4) - 3 \cdot 2 \div (12-9)$

3. $(5^2 + (12-8)^2) - 17$

Insert sets of parentheses to make the following equation true. Then work through Order of Operations to support your answer.

4. $7 + 14 \div 9 - 6 = 7$

B. You should be able to: Add, subtract, multiply and divide integers. Refer to video tutorials at <http://www.khanacademy.org/>

Simplify the following expressions without a calculator. Show work when necessary.

5. $27 - 12 = \underline{\hspace{2cm}}$ 6. $-13 - 9 = \underline{\hspace{2cm}}$ 7. $27 - 100 = \underline{\hspace{2cm}}$

8. $-15 - (-18) = \underline{\hspace{2cm}}$ 9. $-10 \cdot (-3 \cdot 6) = \underline{\hspace{2cm}}$ 10. $(-5)^2 = \underline{\hspace{2cm}}$

11. $-44 \div 4 = \underline{\hspace{2cm}}$ 12. $\frac{-12}{-4} = \underline{\hspace{2cm}}$ 13. $81 \div (-9) = \underline{\hspace{2cm}}$

C. You should be able to: Work with fractions.

Refer to video tutorials at <http://www.khanacademy.org/>

Simplify the following without a calculator, make sure to show all of your work.

14. $\frac{3}{2} \cdot \frac{6}{5} \cdot \frac{15}{30} = \underline{\hspace{2cm}}$

15. $\frac{3}{5} + \frac{5}{8} + \frac{1}{4} = \underline{\hspace{2cm}}$

16. $\frac{3}{4} \div 8 = \underline{\hspace{2cm}}$

17. $\frac{5}{4} - \frac{2}{3} = \underline{\hspace{2cm}}$

18. $\frac{1}{2} \cdot \frac{5}{8} \cdot \frac{4}{5} = \underline{\hspace{2cm}}$

19. $-\frac{16}{9} \div 8 = \underline{\hspace{2cm}}$

20. $-\frac{3}{8} \div \frac{3}{4} =$ _____

21. $5 - \frac{2}{3} =$ _____

D. You should be able to: Simplify algebraic expressions.
Refer to video tutorials at <http://www.khanacademy.org/>

Simplify the following algebraic expressions. Show all work.

22. $-2(3x+2) =$ _____

23. $3(2x-3) + (x-5) =$ _____

24. $4(3x-2) - (5x-6) =$ _____

25. $\frac{3}{4}(4x+12) =$ _____

E. You should be able to: Solve equations.
Refer to video tutorials at <http://www.khanacademy.org/>

Solve the following equations. Show all work.

26. $x+12=62$

27. $48-x=23$

28. $x-2=14+6$

29. $13x=195$

30. $6y-11=25$

31. $8 = \frac{x}{5}$

32. $\frac{x}{42} = \frac{6}{7}$

33. $3x + 7 = 2x - 1$

34. $-8 + 7x - 2 = 3x + 4 + 2x$

35. $-2 - 3(1 - x) = 4(-2x + 7)$

36. $-\frac{1}{2} - \frac{5}{6}x = \frac{3}{4}$

F. You should be able to: Create algebraic equations from verbal expressions.

Refer to video tutorials at <http://www.khanacademy.org/>

Write an algebraic equation for each. Then, solve each equation showing all work.

34. Three times a number, increased by 4, is 25. What is the number?

35. A number divided by .6 is 14. What is the number?

36. One third of a number is equal to 24. What is the number?

37. Eight less than twice a number is twenty. What is the number?

Write an algebraic equation for each of the following. Then solve each percent problem showing all work.

38. What number is 35% of 140?

39. 52 is 13% of what number?

40. 154 is what % of 175?

Solve the following word problems by setting up an algebraic equation. Then, solve the equations showing all work.

41. A \$180 leather jacket is going on sale for a 25% discount. How much will the jacket cost on sale?
42. Mike bought 3 CD's at a cost of \$13.99 for each CD. What will he pay in total including a 7% sales tax?

G. You should be able to: Evaluate expressions.

Refer to video tutorials at <http://www.khanacademy.org/>

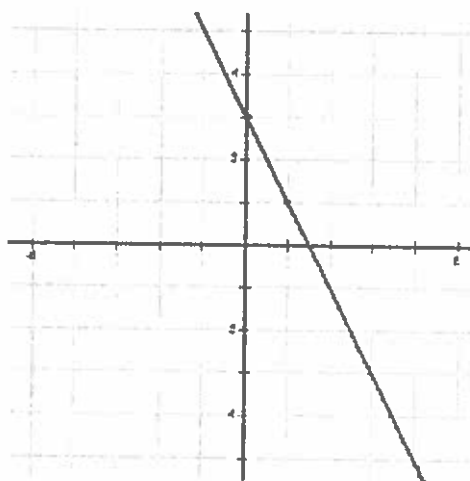
43. Complete the following table by evaluating each expression for the given values.

Expression	$x = 4$	$x = -3$
$3x + 1$	$3(4) + 1 = 13$	$3(-3) + 1 = -8$
x^2		
$2x$		
$x + 6$		

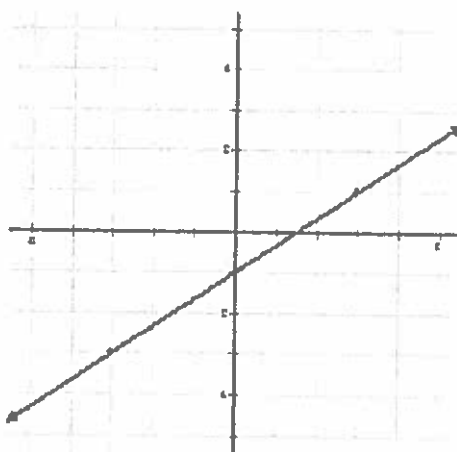
H. You should be able to find the slope of a line.

Refer to video tutorials at <http://www.khanacademy.org/>

44.) Find the slope of the line depicted in the graph below.



45.) Find the slope of the line depicted in the graph below.



46.) Find the slope of the line passing through (2, 4) and (5, 3).

47.) Find the slope of the line passing through (-2, -5) and (2, 3).

48.) Find the slope of the line passing through (-3, 4) and (2, 4). Based on your answer, what kind of line is this?

I. You should be able to graph linear equations.

Refer to video tutorials at <http://www.khanacademy.org/>

Directions:

PROCEDURE 1:

1. Put the equation in slope-intercept form ($y = mx + b$).
2. Identify the y-intercept (b).
3. Plot the y-intercept.
4. Identify the slope of the line (m).
5. Use the slope to graph more points. Use $m = \frac{\text{rise}}{\text{run}}$
6. Draw the line.

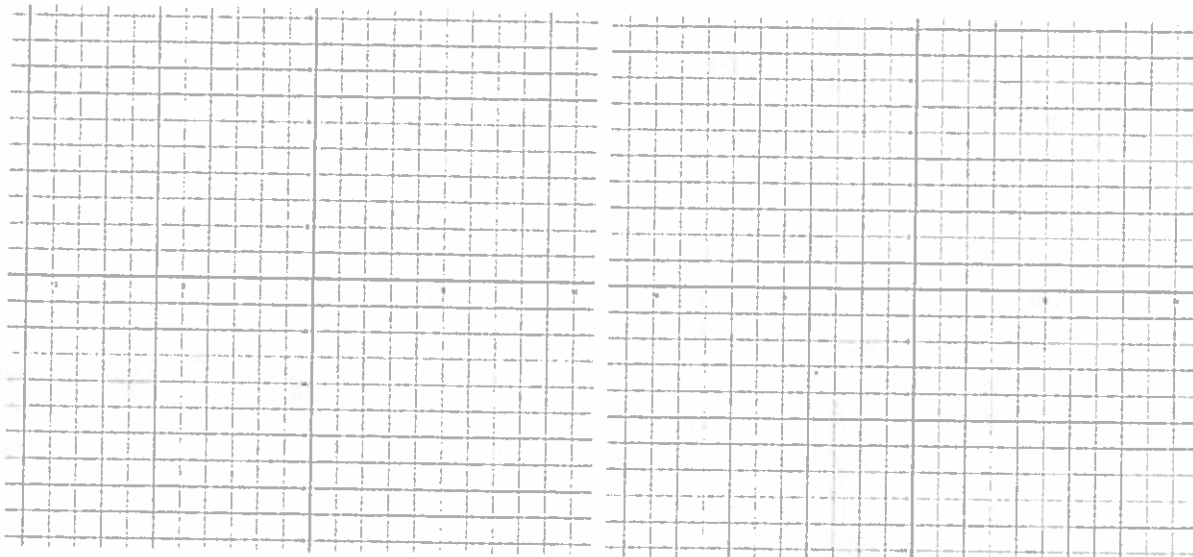
OR USE PROCEDURE 2: Set up a table of values and graph ordered pairs.

Note:

- Horizontal lines are written as $y = c$, where c is a real number. To graph, plot the y-intercept $(0, c)$ and draw a horizontal line through that point.
- Vertical lines are written as $x = c$, where c is a real number. To graph, plot the x-intercept $(c, 0)$ and draw a vertical line through that point.

49.) $y = 2x + 3$

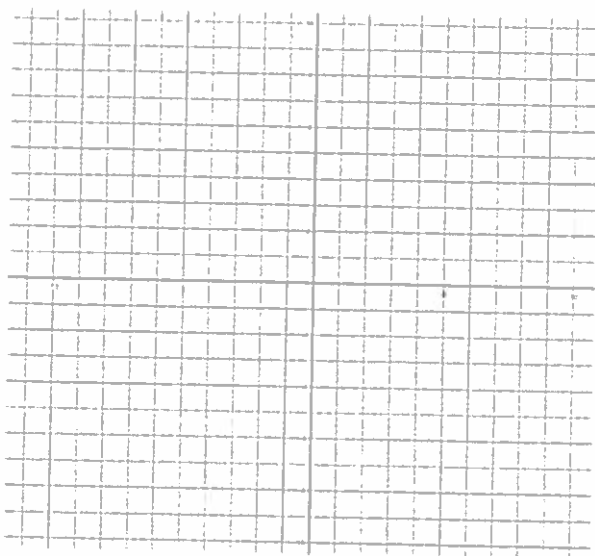
50.) $y = \frac{1}{3}x - 4$



$m =$ _____
 $b =$ _____

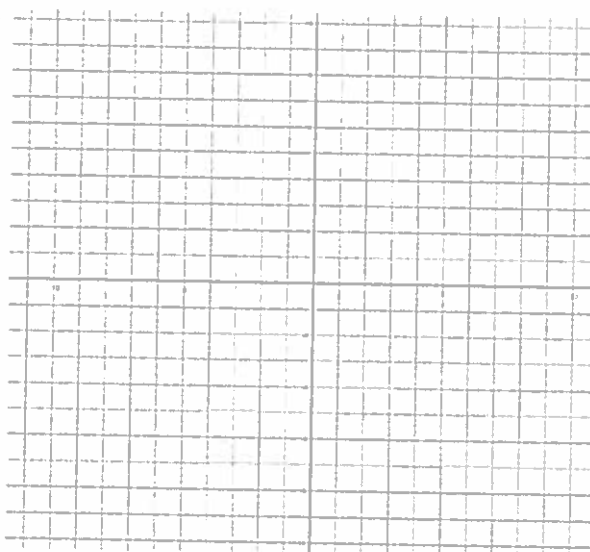
$m =$ _____
 $b =$ _____

51.) $2x + 3y = 12$



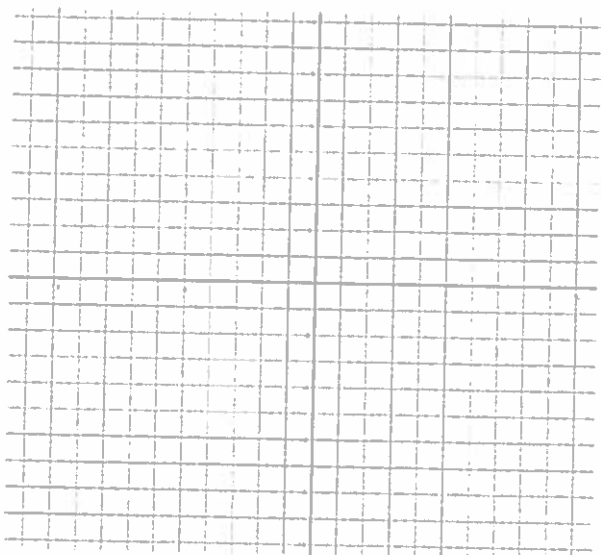
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

52.) $-4x = 2y - 8$



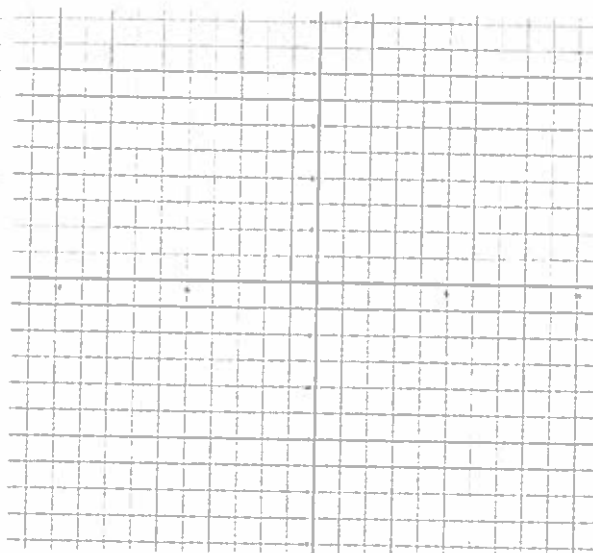
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

53.) $y = -\frac{3}{2}x + 5$



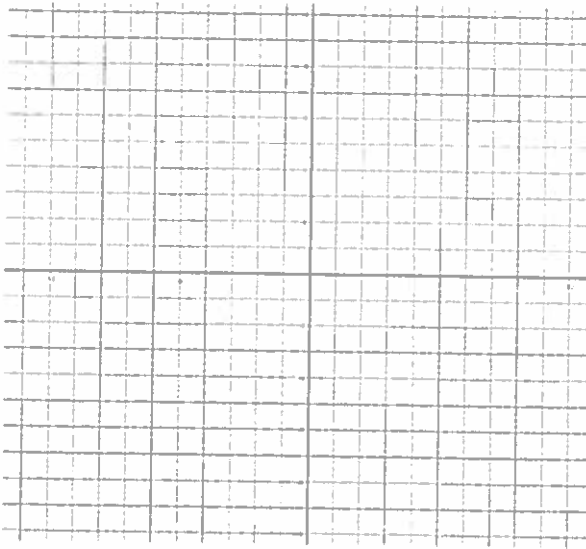
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

54.) $y = x$



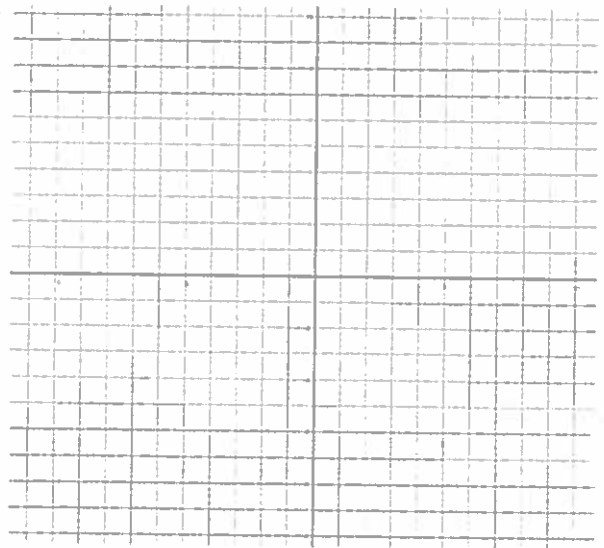
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

55.) $y = -x - 1$



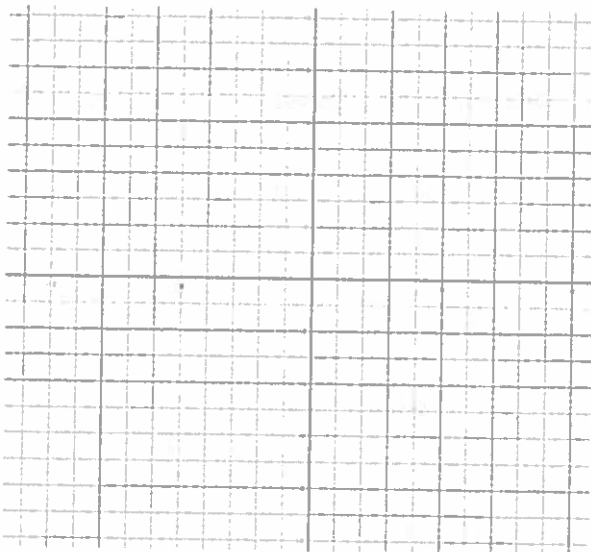
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

56.) $y = 2$



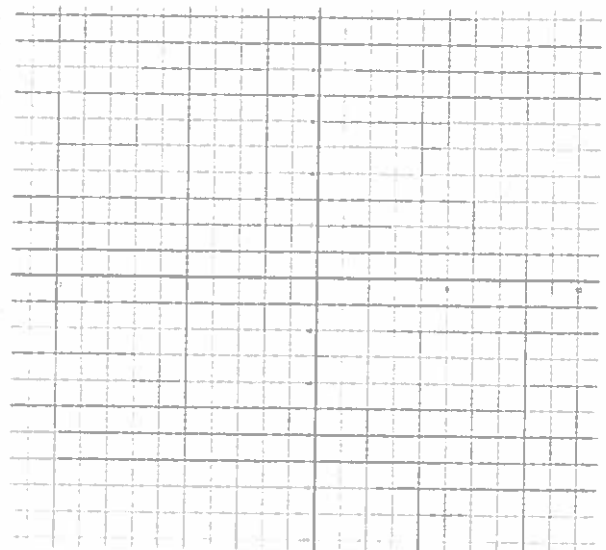
$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

57.) $y = -6$



$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

58.) $x = 3$



$$m = \underline{\hspace{2cm}}$$
$$b = \underline{\hspace{2cm}}$$

Answers to ALGEBRA I summer packet

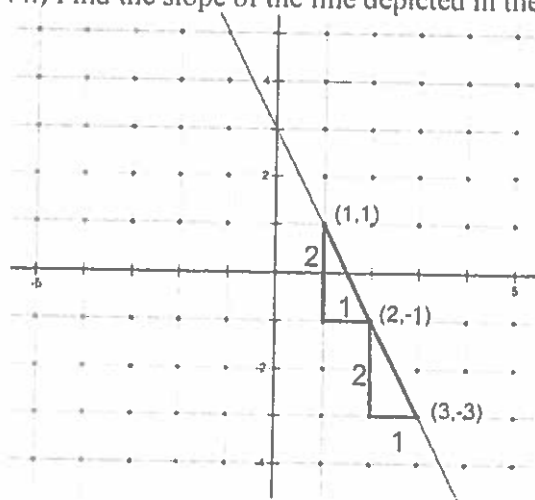
- 1) 54
- 2) 54
- 3) 24
- 4) $(7+14)+(9-6)=7$
- 5) 15
- 6) -22
- 7) -73
- 8) 3
- 9) 180
- 10) 25
- 11) -11
- 12) 3
- 13) -9
- 14) $9/10$
- 15) $59/40$
- 16) $3/32$
- 17) $7/12$
- 18) $1/4$
- 19) $-2/9$
- 20) $-1/2$
- 21) $13/3$
- 22) $-6x-4$
- 23) $7x-14$
- 24) $7x-2$
- 25) $3x+9$
- 26) $x=50$
- 27) $x=25$
- 28) $x=22$
- 29) $x=15$
- 30) $y=6$
- 31) $40=x$
- 32) $x=36$
- 33) $x = -8$
- 34) $x = 7$
- 35) $x = 3$
- 36) $x = -3/2$ OR $x = -1.5$
- 34) $3x+4=25; x=7$
- 35) $n \div 0.6=14; n=8.4$
- 36) $1/3n=24; n=72$
- 37) $2x-8=20; x=14$
- 38) 49
- 39) 400
- 40) 88
- 41) $180(0.75)=x; x=\$135$

42) $3(13.99)+0.07(3(13.99))=x; x=\44.91

43) (see table below)

16	9
8	-6
10	3

44.) Find the slope of the line depicted in the graph below.



-First, choose a point to start at.

-Let's start at (1, 1). We count the change in the y-direction, then the change in the x-direction.

-From (1, 1), we go DOWN 2 units, then RIGHT 1 unit to get to our next coordinate (2, -1).

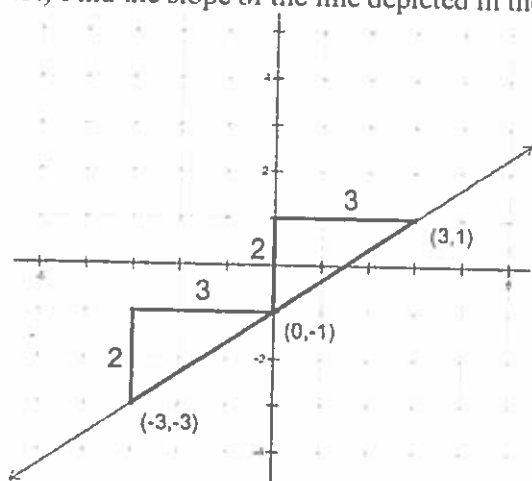
-Notice if we go DOWN 2 units and RIGHT 1 unit again from (2, -1), we land at our next coordinate, (3, -3).

*Remember, the slope of a line is the change in y divided by the change in x.

-Therefore, the slope of this line

is $\frac{-2}{1}$ or -2.

45.) Find the slope of the line depicted in the graph below.



-Again, we start by choosing a point to begin with.

-Start at $(-3, -3)$.

-From $(-3, -3)$ we move UP 2 units and RIGHT 3 units to $(0, -1)$.

-So, our change in y is **positive 2** and our change in x is 3.

-Therefore, our slope is $\frac{2}{3}$.

-Notice if we go UP 2 units and RIGHT 3 units from $(0, -1)$, we land at our next coordinate, $(3, 1)$.

-The slope is the same for the whole line.

46.) Find the slope of the line passing through $(2, 4)$ and $(5, 3)$.

We find the slope between 2 points algebraically by using the slope formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad (\text{or the change in } y \text{ divided by the change in } x)$$

Here, we have $(x_1, y_1) (x_2, y_2)$
 $(2, 4) (5, 3)$ So, $m = \frac{3 - 4}{5 - 2} = \frac{-1}{3}$.

The slope is negative one third.

47.) Find the slope of the line passing through $(-2, -5)$ and $(2, 3)$.

Again, we find the change in y over the change in x using $m = \frac{y_2 - y_1}{x_2 - x_1}$.

$$\text{So, } m = \frac{3 - (-5)}{2 - (-2)} = \frac{8}{4} = \frac{2}{1} = 2.$$

The slope of this line is positive 2.

- 48) Find the slope of the line passing through $(-3, 4)$ and $(2, 4)$. Based on your answer, what kind of line is this?

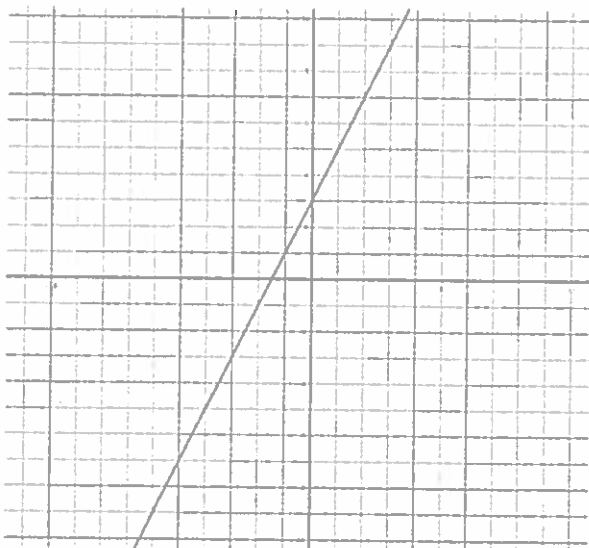
$$\text{Use } m = \frac{y_2 - y_1}{x_2 - x_1}.$$

$$\text{So, } m = \frac{4 - 4}{2 - (-3)} = \frac{0}{5} = 0.$$

The slope of this line is positive 0.

A line with a slope of zero has no change in y , meaning the line is horizontal.

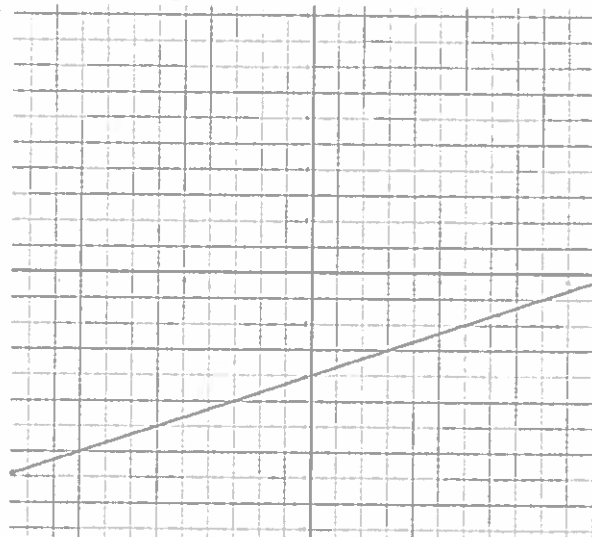
49.) $y = 2x + 3$



$$m = 2$$

$$b = 3$$

50.) $y = \frac{1}{3}x - 4$

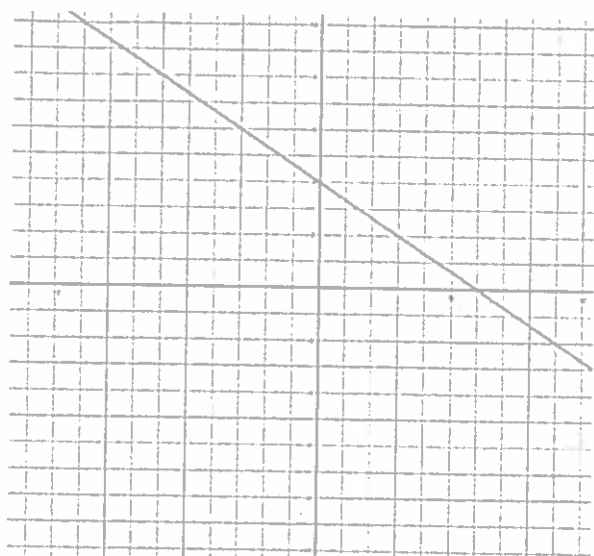


$$m = \frac{1}{3}$$

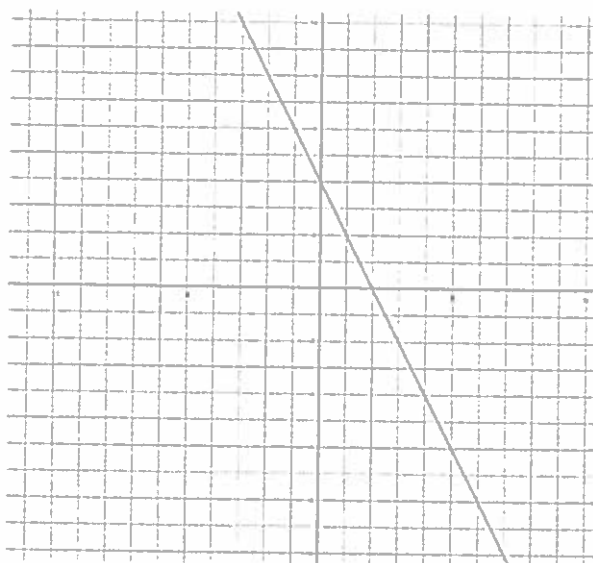
$$b = -4$$

51.) $2x + 3y = 12$ $y = -\frac{2}{3}x + 4$

52.) $-4x = 2y - 8$ $y = -2x + 4$

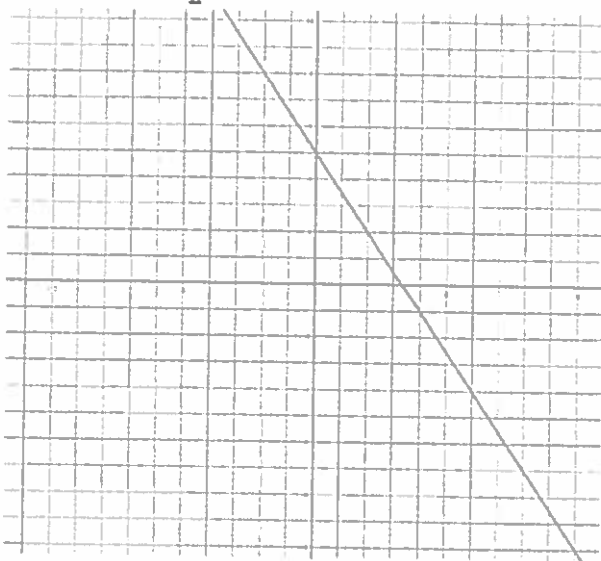


$$m = -\frac{2}{3}$$
$$b = 4$$



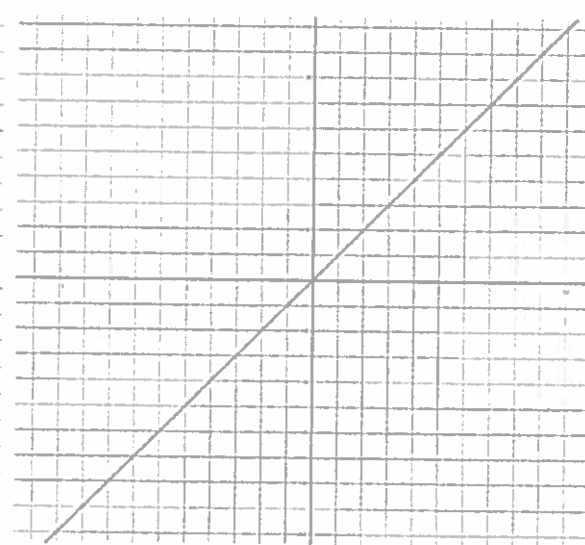
$$m = -2$$
$$b = 4$$

53.) $y = -\frac{3}{2}x + 5$



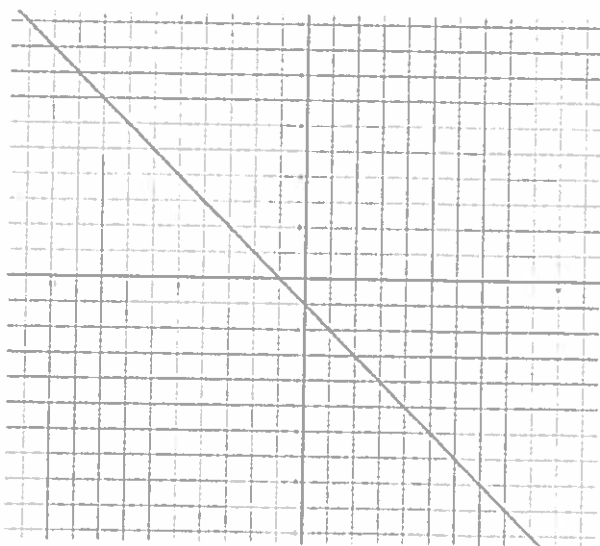
$$m = -\frac{3}{2}$$
$$b = 5$$

54.) $y = x$



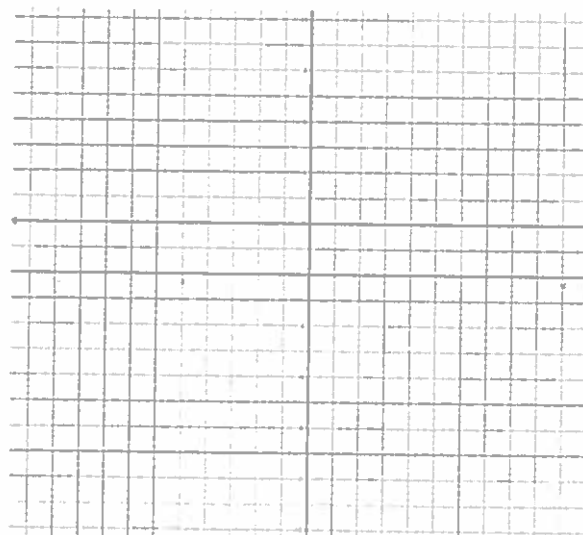
$$m = 1$$
$$b = 0$$

55.) $y = -x - 1$



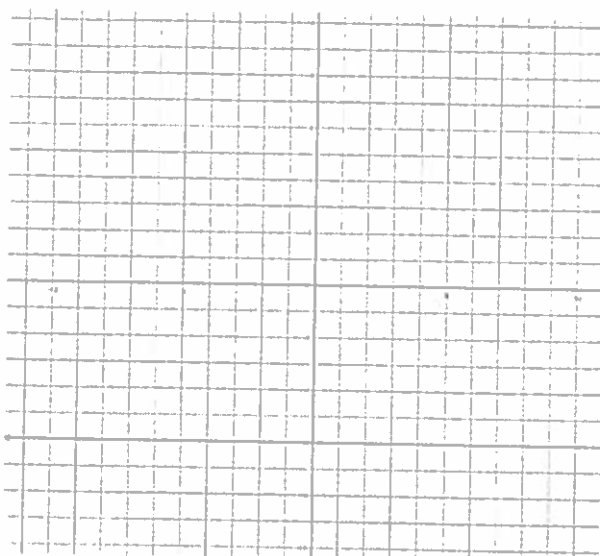
$$m = -1$$
$$b = -1$$

56.) $y = 2$



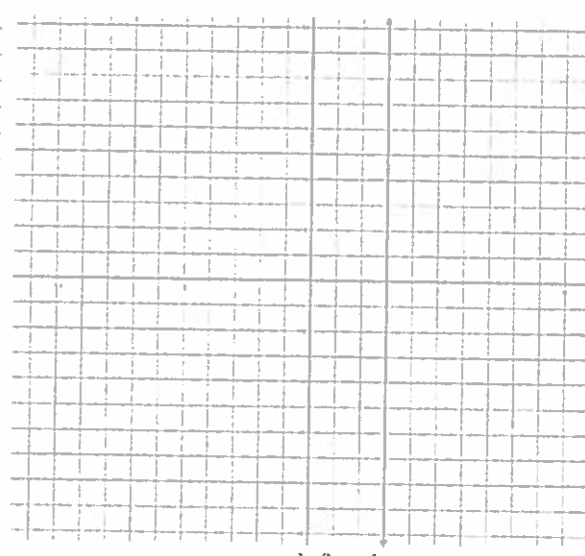
$$m = 0$$
$$b = 2$$

57.) $y = -6$



$$m = 0$$
$$b = -6$$

58.) $x = 3$



$$m = \text{undefined}$$
$$b = \text{none}$$