Lower Dauphin Senior High School

Summer Course Work

In preparation for

Honors Geometry

Completion of this work
is required on the THIRD day of the
2017-2018 school year

Student Name Answer Key 2017

Lower Dauphin Senior High School

Summer Course Work

Geometry Honors

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All pages must show the work in order to be accepted. If more paper is needed, the work may go on the back of each page or neatly on a separate piece of paper.

Completion of this booklet is required by the THIRD day of school.

Vocabulary

Word Bank:

~~coefficient~~	~~constant~~	~~denominator~~	~~difference~~
~~percentage~~	~~like terms~~	~~numerator~~	~~product~~
~~slope-intercept form~~	~~mean~~	~~linear-standard form~~	~~quotient~~
~~range~~	~~sum~~	~~x-intercept~~	~~y-intercept~~
~~mode~~	~~median~~	~~probability~~	~~slope~~

1. denominator — the bottom number in a fraction
2. sum — an amount obtained by addition
3. slope-intercept form — $y = mx + b$
4. Standard Form — $Ax + By = C$
5. mean — mathematical average of all the terms in a data set
6. product — an amount obtained by multiplication
7. y-intercept — the point where a line crosses the *y-axis*
8. median — a value or quantity at the midpoint of a data set
9. quotient — an amount obtained by division
10. x-intercept — the point where a line crosses the x-axis
11. numerator — the top number in a fraction
12. difference — an amount obtained by subtraction
13. coefficient — the number being multiplied by a variable (the number in front of the variable
14. constant — a term that has no variable factor (it is just a number)
15. like terms — terms with exactly the same variable
16. slope — the ratio of a line's vertical change to its horizontal change
17. mode — the most frequently occurring value in a data set
18. percentage — a rate, number, or amount in each hundred
19. Probability — the likelihood of a given event's occurrence
20. range — the difference between the lowest and highest values

Formulas

Match the following formulas to their correct descriptions.

21. D Slope-Intercept Form

22. B Standard Form of a Line

23. A Slope

24. E Distance Formula

25. F Midpoint Formula

26. G Quadratic Formula

27. C Pythagorean Theorem

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

B. $Ax + By = C$

C. $a^2 + b^2 = c^2$

D. $y = mx + b$

E. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

F. $M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$

G. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Fractions

Perform the indicated operation and simplify, if necessary.

28. $\frac{5}{4}+\frac{3}{4}=$ $\frac{8}{4}=2$

29. $\frac{7}{8}-\frac{4}{8}=$ $\frac{3}{8}$

30. $\frac{6}{7}+\frac{3}{2}=$ $\frac{12}{14}+\frac{21}{14}=\frac{33}{14}$

31. $\frac{1}{9}\div\frac{7}{8}=$ $\frac{1}{9}\cdot\frac{8}{7}=\frac{8}{63}$

32. $\frac{15}{3}-\frac{12}{5}=$ $\frac{75}{15}-\frac{36}{15}=\frac{39}{15}$

33. $-\frac{3}{5}-\frac{2}{7}=$ $-\frac{21}{35}-\frac{10}{35}=-\frac{31}{35}$

34. $\frac{2}{3}\bullet\frac{5}{8}=$ $\frac{5}{12}$

35. $-\frac{5}{3}\bullet\frac{2}{5}=$ $-\frac{2}{3}$

36. $\frac{1}{3}\div\frac{5}{2}=$ $\frac{1}{3}\cdot\frac{2}{5}=\frac{2}{15}$

Expressions

Evaluate each of the following expressions. Let $x=4$, $y=-2$, and $z=7$

37. $2x+3y^2$

$2(4)+3(-2)^2$

$8+12$

20

38. $-5(x+y)$

$-5(4+-2)$

$-5(2)$

-10

39. $\frac{-y}{x}$

$\frac{-(-2)}{4}=\frac{2}{4}=\frac{1}{2}$

40. x^3-y^2

$(4)^3-(-2)^2$

60

41. $3xz+z^2y$

$3(4)(7)+(7)^2(-2)$

$84+-98$

-14

Evaluate each expression:

42. $3+7\bullet5-2$

$3+35-2$

36

43. $24-2^2\bullet7-5$

$24-28-5$

-9

44. $2(5+3)-5\bullet4$

$2(8)-20$

-4

45. $-3(12-7)+3^3$

$-3(5)+27$

12

46. $(3-5)^3\div2(4\bullet3)$

$(-2)^3$

$-8\div2\cdot12$

-48

47. $49-(5+2)^2+14$

$49-49+14$

14

48. $\frac{1}{3}(2+4)^2$

$\frac{1}{3}(36)$

12

49. $(7-9^2)\div(5+4)^2$

$(7-81)\div81$

$-74\div81$

$-\frac{74}{81}$

Exponents and Radicals

Simplify the following expressions completely.

50. $\frac{15a^4b^2c^3}{8ac^5}$

$\frac{3a^3b^2}{c^2}$

51. $(x^4)^2$

x^8

52. $(2x^3)^2$

$4x^6$

Simplify. Leave answers in radical form (no decimals).

53. $\sqrt{18}$

$3\sqrt{2}$

54. $5\sqrt{80}$

$20\sqrt{5}$

55. $3\sqrt{2} \cdot 5\sqrt{10}$

$15\sqrt{20}$

$30\sqrt{5}$

56. $\frac{1}{\sqrt{2}}$

$\frac{\sqrt{2}}{2}$

57. $\frac{\sqrt{12}}{\sqrt{5}}$

$\frac{\sqrt{60}}{5} = \frac{2\sqrt{15}}{5}$

58. $\frac{2\sqrt{2}}{\sqrt{3}}$

$\frac{2\sqrt{6}}{3}$

Solving Equations

Solve the following equations.

59. $\frac{r+8}{-3} = -2$

$r + 8 = 6$

$r = -2$

60. $3(x+2) = 18$

$x + 2 = 6$

$x = 4$

61. $-2 + 10x = 8x - 1$

$2x = 1$

$x = \frac{1}{2}$

62. $2(a-3) + 5 = 3(a-1)$

$2a - 6 + 5 = 3a - 3$

$2 = a$

63. $3 + \frac{2}{5}y = 11 - \frac{2}{5}y$

$\frac{4}{5}y = 8$

$y = 10$

64. $2[x + 3(x-1)] = 18$

$2[x + 3x - 3] = 18$

$2[4x - 3] = 18$

$4x - 3 = 9$

$4x = 12$

$x = 3$

65. $1.03t - 4 = 2.15t + 8.72$

$-4 = 1.12t + 8.72$

$-12.72 = 1.12t$

$-11.357 \approx t$ or $-\frac{159}{14}$

66. $-3(x+5) = 8x + 18$

$-3x - 15 = 8x + 18$

$-33 = 11x$

$-3 = x$

Proportions

Solve each proportion for the indicated variable.

67. $\frac{2}{3} = \frac{x}{12}$

$3x = 24$

$x = 8$

68. $\frac{5}{y} = \frac{10}{14}$

$10y = 70$

$y = 7$

69. $\frac{15}{5+3n} = \frac{9}{n}$

$15n = 45 + 27n$

$-27n \quad -27n$

$-12n = 45$

$n = -\frac{15}{4} = -3\frac{3}{4}$

70. $\frac{x+2}{2} = \frac{4x+13}{3}$

$3x+6 = 8x+26$

$-3x \quad -26 \quad -3x \quad -26$

$-20 = 5x$

$-4 = x$

Solve for each problem below by using proportions.

71. Sue was paid $384 for working 32 hours. How many hours will she have to work to earn $672?

$\frac{384}{32} = \frac{672}{x}$

$384x = 21504$

$x = 56$

56 hours

72. Tommy drove 238 miles in 5 hours. How long will it take him to travel the next 72 miles, if he continues at the same speed? (Give your answer in minutes.)

$\frac{238 \text{ mi}}{5 \text{ hr}} = 47.6 \text{ mph}$

$\frac{238}{5} = \frac{72}{x}$

$238x = 360$

$x = 1.5126$

Approx 90.756 min

73. Matt paid $33.41 for 13 gallons of gasoline. How many gallons can he buy if he only has $14?

$\frac{\$33.41}{13 \text{ gal}} = \frac{\$14}{x \text{ gal}}$

$33.41x = 182$

$x = 5.447$ gallons

Factoring Quadratic Equations

Factor the following expressions.

74. $x^2+9x+20$

$(x+5)(x+4)$

75. $x^2-3x-28$

$(x-7)(x+4)$

76. $x^2+4x-32$

$(x+8)(x-4)$

77. x^2-64

$(x+8)(x-8)$

78. $4x^2-25$

$(2x+5)(2x-5)$

79. $3x^2-3x-6$

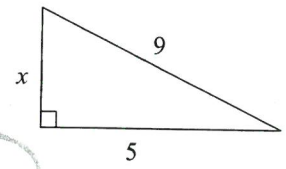
$3(x^2-x-2)$

$3(x-2)(x+1)$

Pythagorean Theorem

Find the missing side length. If needed, round to the nearest tenth.

80.



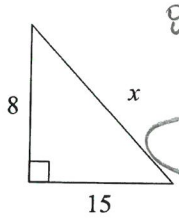
$x^2+5^2=9^2$

$-25 \quad -25$

$\sqrt{x^2}=\sqrt{56}$

$x \approx 7.5$

81.

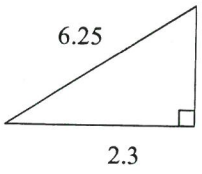


$8^2+15^2=x^2$

$289=x^2$

$17=x$

82.



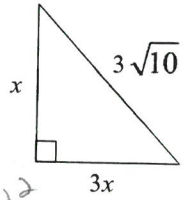
$2.3^2+x^2=6.25^2$

$-5.29 \quad -5.29$

$x^2=33.775$

$x \approx 5.8$

83.



$x^2+(3x)^2=(3\sqrt{10})^2$

$x^2+9x^2=90$

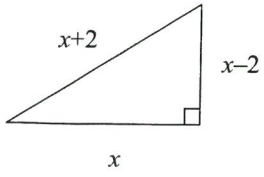
$\frac{10}{10}x^2=\frac{90}{10}$

$x^2=9$

$x=\pm 3$

$x=3$

84.



$x^2+(x-2)^2=(x+2)^2$

$x^2+x^2-4x+4=x^2+4x+4$

$2x^2-4x+4=x^2+4x+4$

$-x^2 \quad -4x \quad -4 \quad -x^2 \quad -4x \quad -4$

$x^2-8x=0$

$x(x-8)=0$

$x=0 \quad x-8=0$

$x=8$

Systems of Equations

Find the value of *x*, and *y* that satisfy each system of equations below.

85. $2x+3y=5$
$x-5y=9$

$-2x+10y=-18$
$13y=-13$
$y=-1$

$2x+3(-1)=5$
$2x-3=5$
$+3 \quad +3$
$\frac{2x}{2}=\frac{8}{2}$
$x=4$

$(4,-1)$

86. $-3x+y=2$
$8x-15y=7$

$y=3x+2$
$8x-15(3x+2)=7$
$8x-45x-30=7$
$+30 \quad +30$
$\frac{-37x}{-37}=\frac{37}{-37}$
$x=-1$

$y=3(-1)+2$
$=-1$

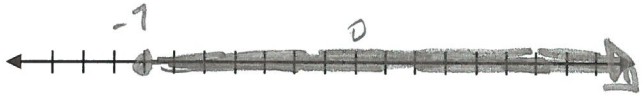
$(-1,-1)$

Number Line Inequalities

Graph each inequality on a number line.

87. $18+4x\leq 50$
$-18 \quad -18$
$\frac{4x}{4}\leq\frac{32}{4}$
$x\leq 8$

88. $7-2t\leq 21$
$-7 \quad -7$
$\frac{-2t}{-2}\leq\frac{14}{-2}$
$t\geq -7$

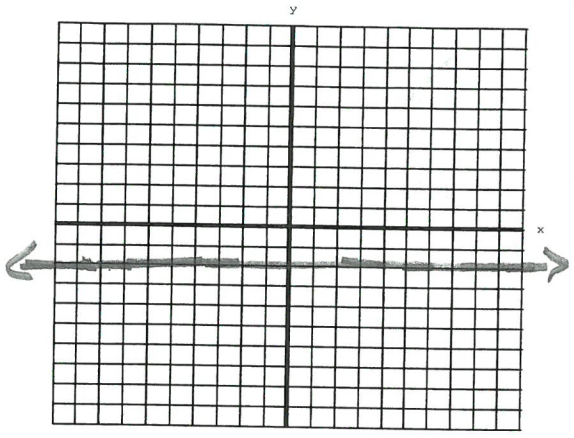


89. $2x-6\geq -6x+2$
$+6x+6 \quad +6x+6$
$\frac{8x}{8}\geq\frac{8}{8}$
$x\geq 1$

90. $-3x>12$ or $4x\geq -10$
$\frac{-3x}{-3}>\frac{12}{-3} \quad \frac{4x}{4}\geq\frac{-10}{4}$
$x<-4$ or $x\geq -2.5$

Graphing Functions

91. $y = -2$

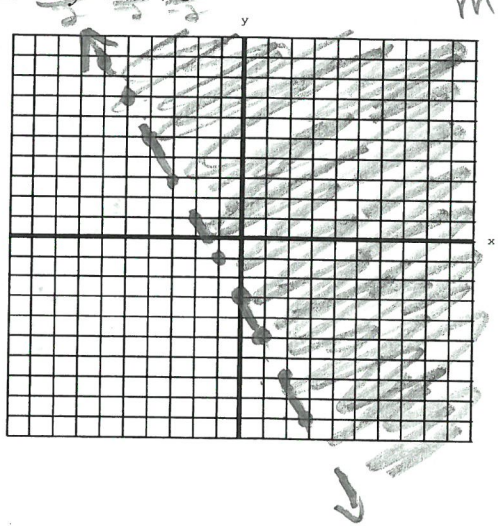


92. $-2y < 4x + 6$

$y > -2x - 3$

$b = -3$

$m = -2$

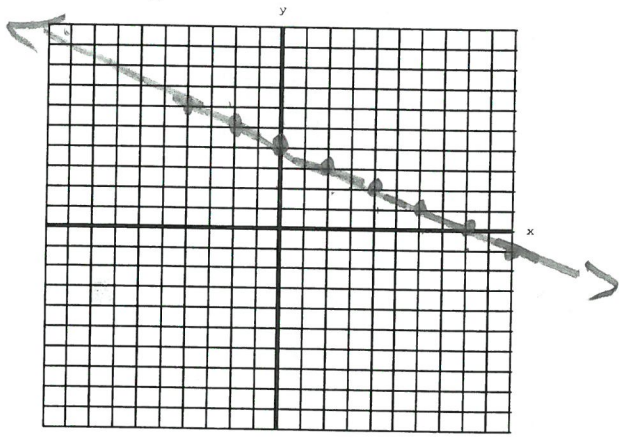


dotted line

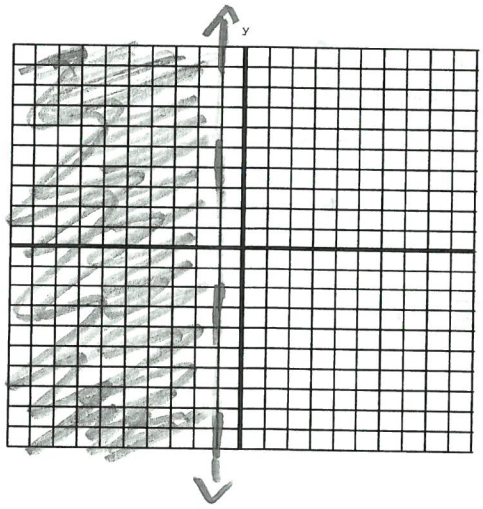
93. $y = -\frac{1}{2}x + 4$

$b = 4$

$m = -\frac{1}{2}$



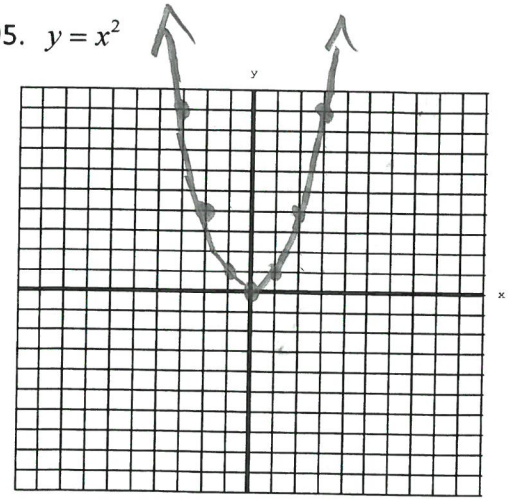
94. $x < -1$



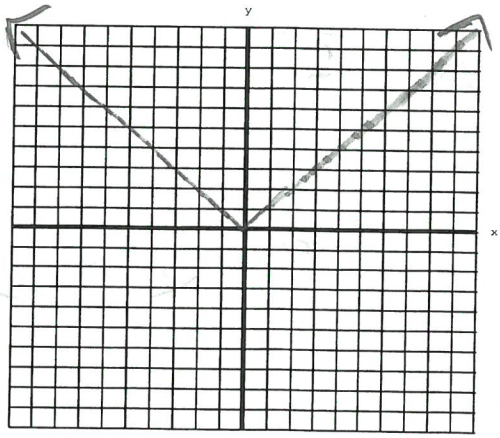
dotted line

95. $y = x^2$

x	y
3	9
2	4
1	1
0	0
-1	1
-2	4
-3	9



96. $y = |x|$



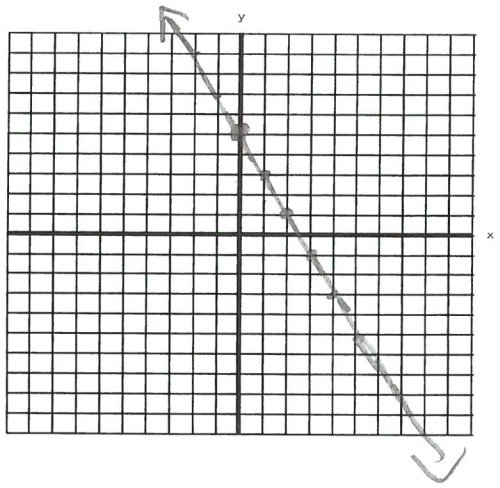
x	y
4	4
3	3
2	2
1	1
0	0
-1	1
-2	2
-3	3
-4	4

b = -5
m = -2

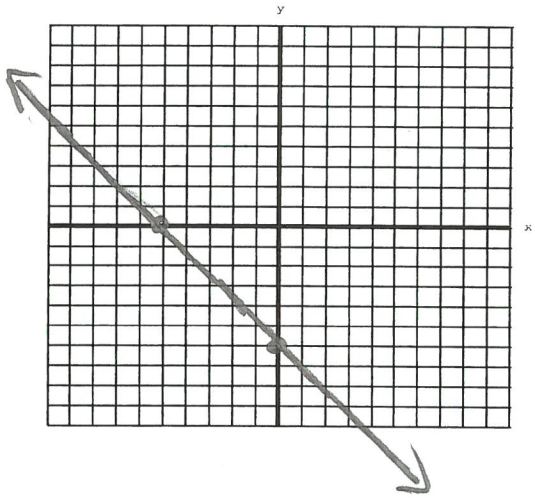
$2x+y=5$
$-2x \quad -2x$
$y = -2x+5$

easiest to use intercepts (0,-6) (-5,0)

97. $2x+y=5$



98. $6x-5y=30$

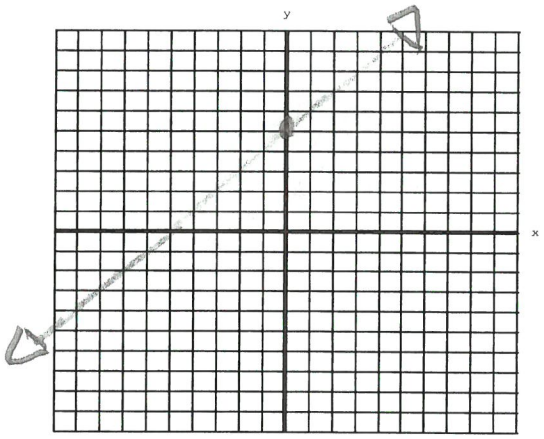


99. Write the equation of a line that passes through (–3, 2) and is parallel to $x-y=7$. Then graph.

x y
m = 1 (-3, 2)

y = mx + b
2 = 1(-3) + b
2 = -3 + b
+3 +3
5 = b

y = 1x + 5



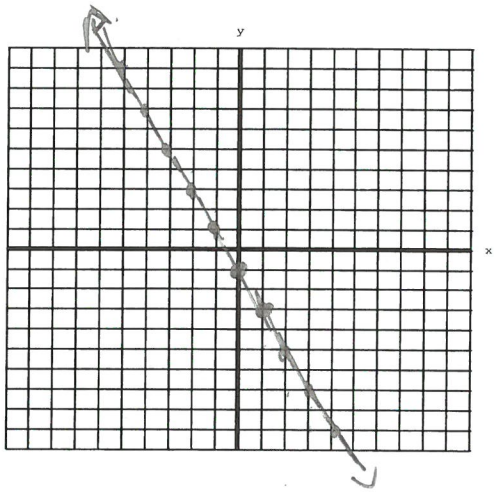
x - y = 7
-x -x
-y = -x + 7
-1 -1 -1
y = x - 7
m = 1

100. Write the equation of the line that passes through (–5, 9) and (–4, 7) in slope-intercept form. Then graph.

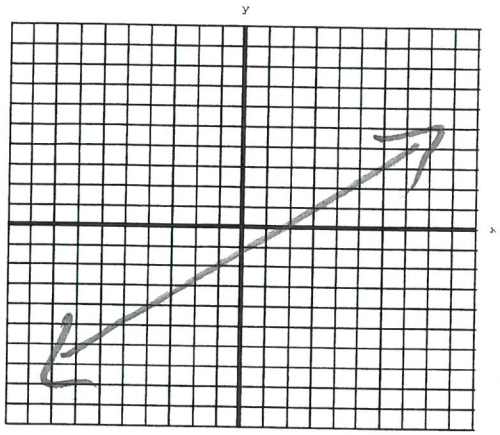
$m = \frac{7-9}{-4+5} = \frac{-2}{1} = -2$

y = mx + b
7 = -2(-4) + b
7 = 8 + b
-8 -8
-1 = b

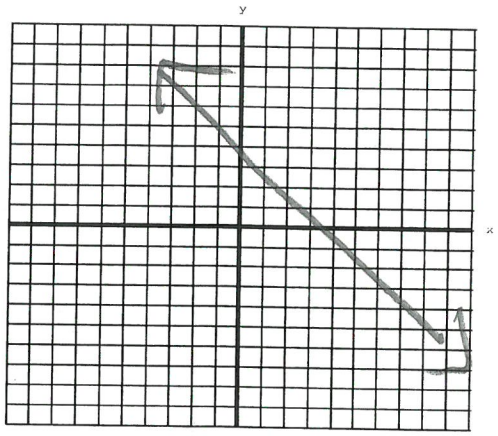
y = -2x - 1



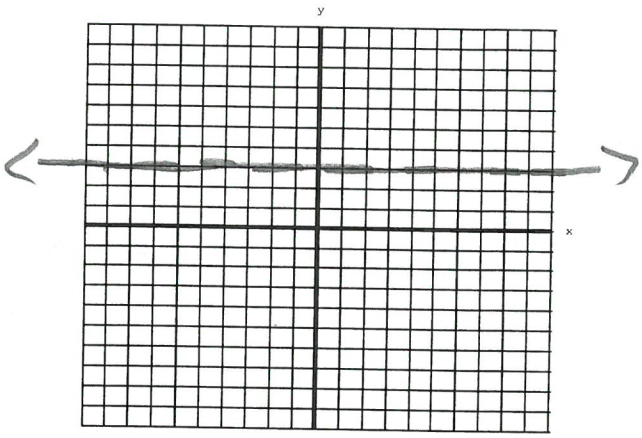
101. Sketch a line with the appropriate slope.



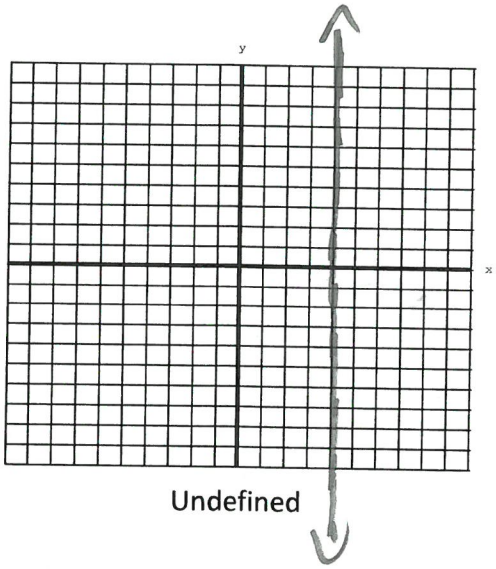
Positive



Negative



Zero



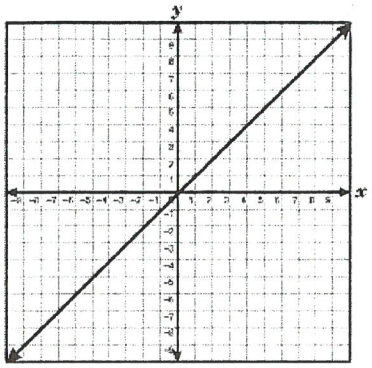
Undefined

Various Graphs

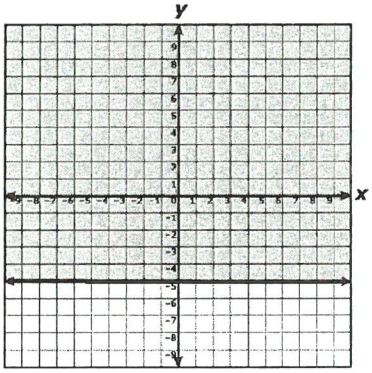
Write the equations or inequalities for the following graphs.

102. $y = x$

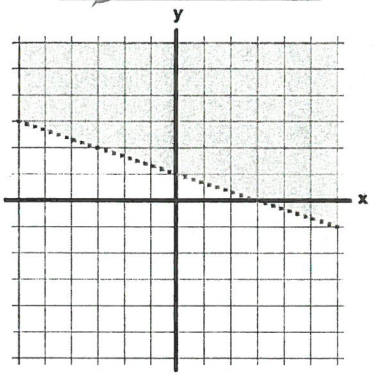
m = 1
b = 0



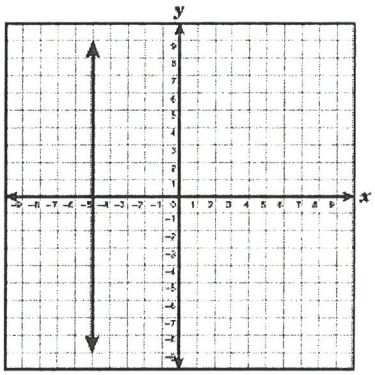
103. $y \geq -5$



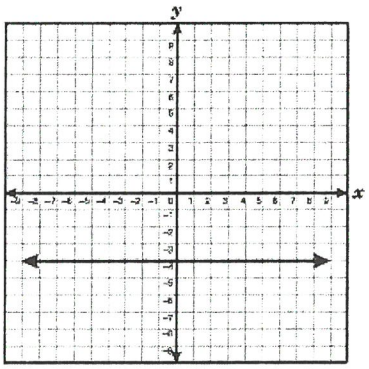
104. $y > -\frac{1}{3}x + 1$



105. $x = -5$



106. $y = -4$



107. $y \leq 2x - 3$