

Algebra 2/Honors Optional Summer Packet

Date _____

This packet is full of the Algebra 1 topics that you've learned in the past. It would be really beneficial to your success in the next math course for you to have mastered all of these concepts and remember them when you return next year. This packet is a completely optional way to practice those concepts. You may do all of it or just pick and choose to do only topics you need more practice on.

If there are any topics that you do not know or do not remember how to do, the topic name is in all capital letters so you can easily search videos on kahn academy or youtube for a refresher.

ORDER OF OPERATIONS - Evaluate each expression.

1) $(9 \cdot 2 - 3) \div 3$

2) $2 + 3 + 5 - 4 \cdot 2$

3) $3^2 + 3 \cdot 6 \div 2 \cdot 4$

4) $5 - 2 + 5 - ((12 \div 6)^2 + 2)$

EVALUATING EXPRESSIONS - Evaluate each using the values given.

5) $pm - n$; use $m = 2$, $n = 3$, and $p = 2$

6) $z + y^2 \div 5$; use $y = 5$, and $z = 5$

THE DISTRIBUTIVE PROPERTY AND COMBINING LIKE TERMS - Simplify each expression.

7) $-5(6 + 3n)$

8) $6m + 2m$

9) $2(1 + 8p) - 7$

10) $-2n - 5(1 - 8n)$

SOLVING LINEAR EQUATIONS - Solve each equation.

11) $k - 19 = -38$

12) $8a = -80$

13) $2n + 5 = -7$

14) $2x - 1 = -15 - 5x$

15) $3x + 2 - 8 = 10 + 5x$

16) $8x + 3 - 3x = 8$

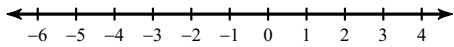
17) $5(5r - 7) = -85$

18) $5k + 8(7 + k) = -2k + 26$

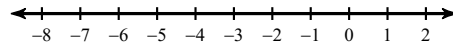
- 19) Pinkberry charges \$5 for a medium cup of ice cream and charges \$0.45 for every ounce of ice cream and toppings that are added. Jessica's cup of ice cream cost \$9.95. Define your variable and write an equation to represent how many ice cream and toppings Jessica added. Then solve the equation.

LINEAR INEQUALITIES - Solve each inequality and graph its solution.

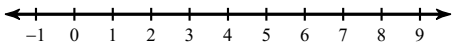
20) $k - 11 < -9$



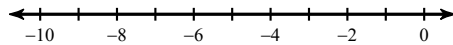
21) $8 - n + 3 \geq 17$



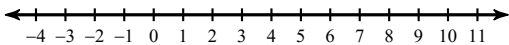
22) $-8m - 5 < -15 - 6m$



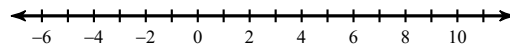
23) $-4(8 - 8x) > -160$



24) $n - 6 \leq 3$ and $-2n \leq 4$



25) $-9 + 9m \geq 54$ or $10m + 3 \leq -17$



PROPORTIONS - Solve each proportion.

26) $\frac{4}{3} = \frac{9}{n}$

27) $\frac{7}{5} = \frac{n}{3}$

28) $\frac{2}{10} = \frac{6}{a}$

29) $\frac{3}{m+1} = \frac{2}{3}$

PERCENT PROBLEMS - Solve each problem.

30) What is 73% of 118?

31) 6% of what is 54?

32) What percent of 37 is 6?

33) 39% of what is 7?

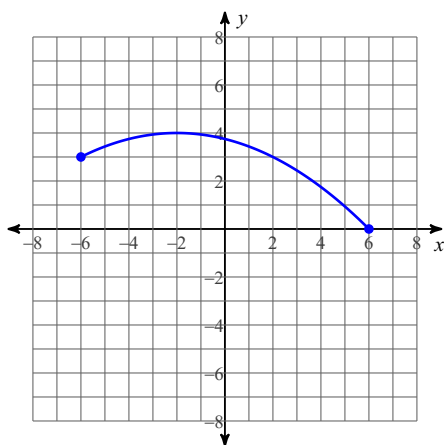
DOMAIN AND RANGE - Determine the domain and range of each of the following relations.

34)

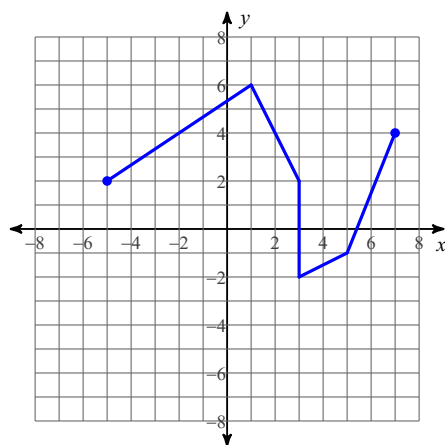
x	y
-5	4
1	-1
3	7
4	7
7	-5

35) $\{(1, -1), (1, -3), (5, -6), (6, -7), (7, 5)\}$

36)



37)



FUNCTIONS - Determine whether each of the following relations is a function.

38)

x	y
-4	-7
1	-2
2	4
4	0
6	2

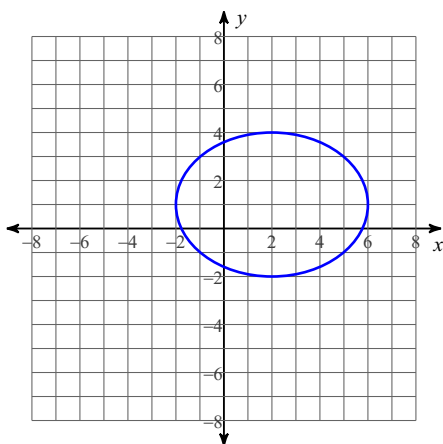
39)

x	y
-6	5
-6	7
-1	0
1	-4
3	4

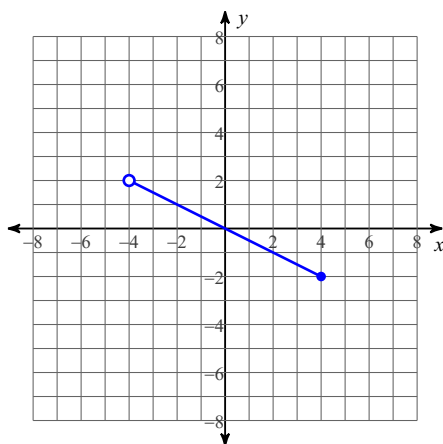
40) $\{(-5, 1), (-3, 1), (2, 5), (2, 2), (3, 6)\}$

41) $\{(-5, -6), (-3, 7), (-1, -2), (1, -1), (4, -1)\}$

42)



43)



FUNCTION NOTATION - Using your knowledge of function notation, interpret and answer the question.

44) $f(x) = -2x - 3$; Find $f(2)$

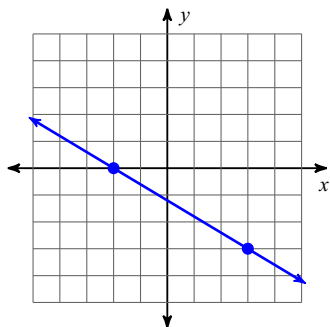
45) $f(x) = 3x - 1$; Find $f(0)$

46) $f(x) = 2x + 3$; Find x if $f(x) = 5$

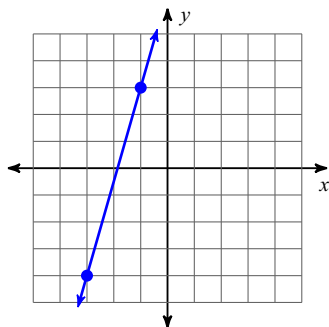
47) $f(x) = 2x - 2$; Find x if $f(x) = -10$

SLOPE OF A LINE - Find the slope with the given information.

48)



49)

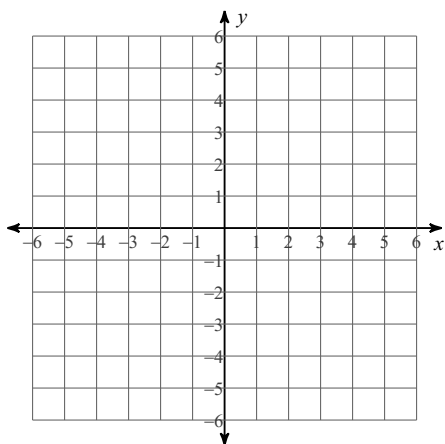


50) $(-3, -13), (7, -9)$

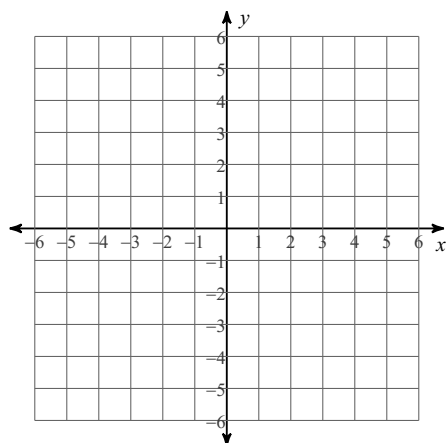
51) $(18, 12), (6, -4)$

GRAPHING LINES - Sketch the graph of each line.

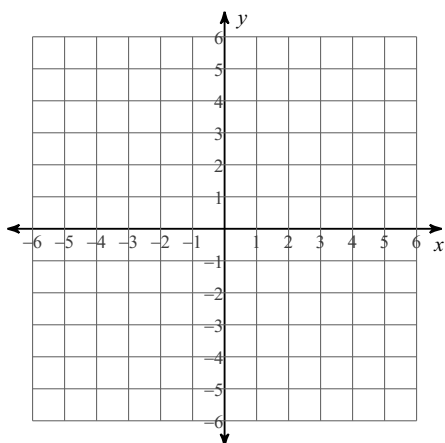
52) $y = \frac{4}{5}x + 3$



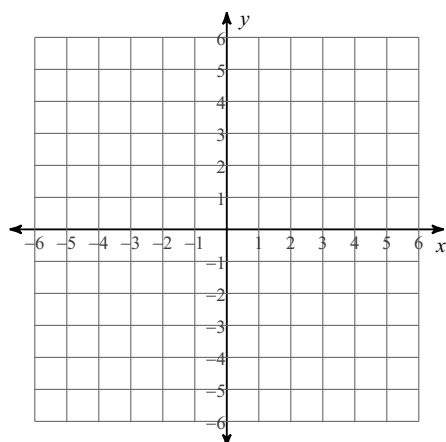
53) $y = 5x$



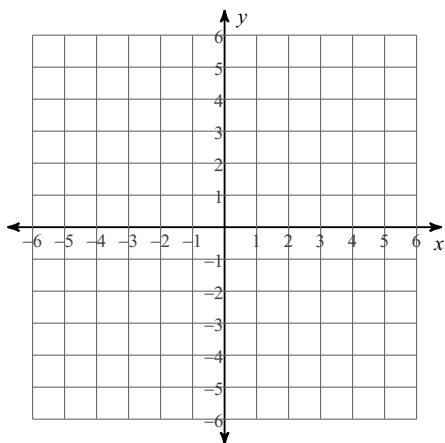
54) $y = 4x + 1$



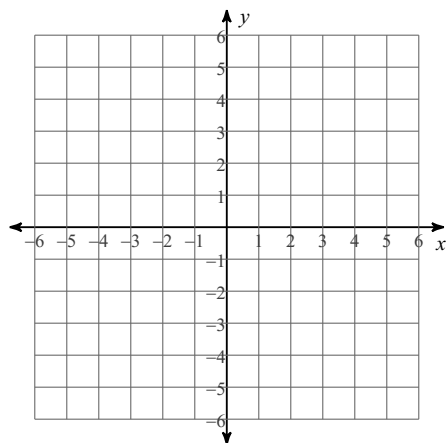
55) $y = -\frac{2}{5}x - 2$



56) $2x + 3y = 9$



57) $x - 2y = 8$



WRITING EQUATIONS IN SLOPE INTERCEPT FORM - write the equation in slope intercept ($y=mx+b$) form with the given information.

58) Point: $(2, -2)$, slope $= -\frac{7}{2}$

59) Points: $(0, -4)$ and $(-1, 5)$

60) Point: $(4, 4)$, parallel to $y = \frac{5}{2}x + 1$

61) Point: $(1, -2)$, perp. to $y = -\frac{1}{7}x - 4$

POINT SLOPE FORM - Write the point-slope form ($y - y_1 = m(x - x_1)$) of the equation of the line through the given point with the given slope.

62) Point: $(4, 5)$, slope $= \frac{9}{4}$

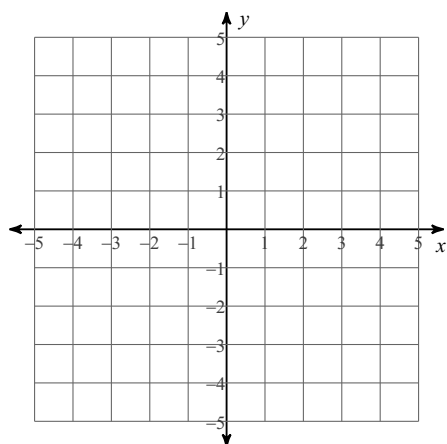
63) Points: $(5, -5)$ and $(-2, 1)$

64) Point: $(5, 1)$, parallel to $y = \frac{6}{7}x + 1$

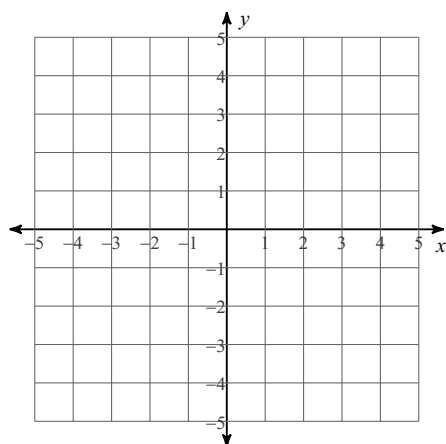
65) through: $(-4, -3)$, perp. to $y = -2x - 1$

SOLVING SYSTEMS OF EQUATIONS BY GRAPHING - Solve each system by graphing.

66) $y = \frac{1}{2}x - 2$
 $y = \frac{7}{4}x + 3$



67) $y = -\frac{2}{3}x - 4$
 $y = \frac{1}{3}x - 1$



SOLVING SYSTEMS OF EQUATIONS BY SUBSTITUTION - Solve each system by substitution.

$$\begin{aligned} 68) \quad y &= -6x + 6 \\ -x + 3y &= -20 \end{aligned}$$

$$\begin{aligned} 69) \quad 6x + y &= 17 \\ x &= y + 4 \end{aligned}$$

$$\begin{aligned} 70) \quad -2x - 3y &= 4 \\ x + 6y &= -11 \end{aligned}$$

$$\begin{aligned} 71) \quad -3x + y &= -19 \\ -7x - 5y &= -15 \end{aligned}$$

SOLVING SYSTEMS OF EQUATIONS BY ELIMINATION - Solve each system by elimination.

72) $8x - 12y = -28$
 $3x + 3y = -3$

73) $5x - 6y = -28$
 $-6x - 12y = -24$

74) $4x - 8y = -4$
 $9x - 5y = 30$

75) $6x - 9y = -6$
 $-4x + 5y = 6$

Simplify. Your answer should contain only positive exponents.

76) $3xy^3 \cdot 2x^3y^2$

77) $2yx^2 \cdot 4x^4y^3$

78) $\frac{9x^3y^4}{3x^2}$

79) $\frac{8x^4y^3}{4xy^2}$

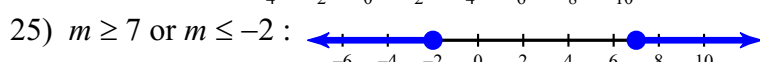
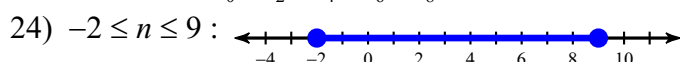
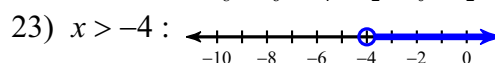
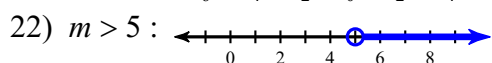
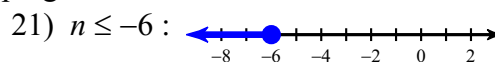
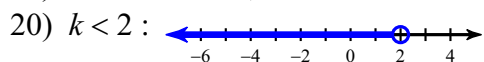
80) $(4x^4y^2)^3$

81) $(4xy^2)^2$

Answers to Algebra 2/Honors Optional Summer Packet

- | | | | |
|---------------|---------------|----------------|---------------|
| 1) 5 | 2) 2 | 3) 45 | 4) 2 |
| 5) 1 | 6) 10 | 7) $-30 - 15n$ | 8) $8m$ |
| 9) $-5 + 16p$ | 10) $38n - 5$ | 11) $\{-19\}$ | 12) $\{-10\}$ |
| 13) $\{-6\}$ | 14) $\{-2\}$ | 15) $\{-8\}$ | 16) $\{1\}$ |
| 17) $\{-2\}$ | 18) $\{-2\}$ | | |

19) $0.45x + 5 = 9.95$, $x = 11$ ounces of ice cream and toppings



26) $\{6.75\}$ 27) $\{4.2\}$ 28) $\{30\}$ 29) $\{3.5\}$

30) 86.1 31) 900 32) 16.2% 33) 17.9

34) Domain: $\{-5, 1, 3, 4, 7\}$ 35) Domain: $\{1, 5, 6, 7\}$ 36) Domain: $-6 \leq x \leq 6$
 Range: $\{-5, -1, 4, 7\}$ Range: $\{-7, -6, -3, -1, 5\}$ Range: $0 \leq y \leq 4$

37) Domain: $-5 \leq x \leq 7$ 38) The relation is a function.

Range: $-2 \leq y \leq 6$

39) The relation is not a function.

40) The relation is not a function.

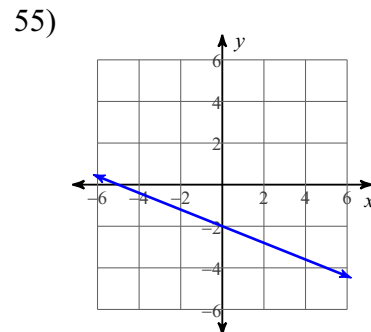
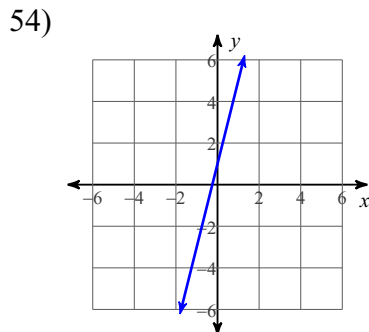
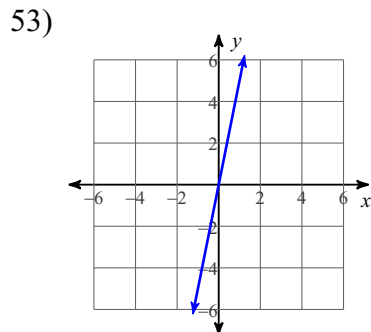
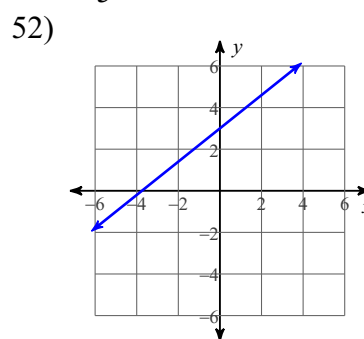
41) The relation is a function. 42) The relation is not a function.

43) The relation is a function. 44) -7 45) -1

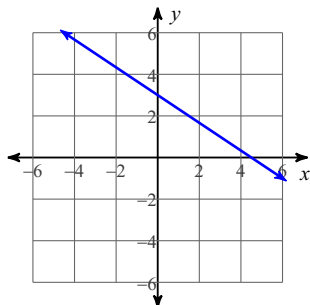
46) 1 47) -4

48) $-\frac{3}{5}$ 49) $\frac{7}{2}$

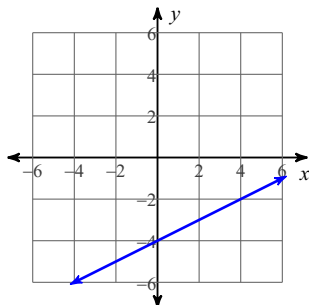
50) $\frac{2}{5}$ 51) $\frac{4}{3}$



56)



57)



58) $y = -\frac{7}{2}x + 5$

59) $y = -9x - 4$

60) $y = \frac{5}{2}x - 6$

61) $y = 7x - 9$

62) $y - 5 = \frac{9}{4}(x - 4)$

63) $y + 5 = -\frac{6}{7}(x - 5)$

64) $y - 1 = \frac{6}{7}(x - 5)$

65) $y + 3 = \frac{1}{2}(x + 4)$

66) $(-4, -4)$

67) $(-3, -2)$

68) $(2, -6)$

69) $(3, -1)$

70) $(1, -2)$

71) $(5, -4)$

72) $(-2, 1)$

73) $(-2, 3)$

74) $(5, 3)$

75) $(-4, -2)$

76) $6x^4y^5$

77) $8y^4x^6$

78) $3xy^4$

79) $2x^3y$

80) $64x^{12}y^6$

81) $16x^2y^4$