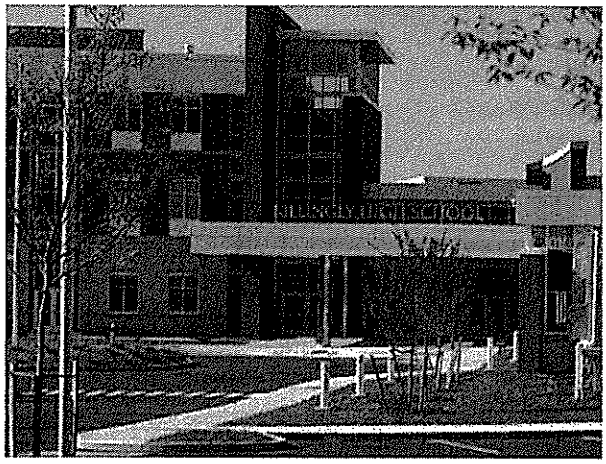
HONORS

Killingly High School

Summer Math Packet: Incoming Honors Algebra I



Dear Student,

Happy summer vacation! We hope you will enjoy yourself during the long summer ahead. Doing this packet will help you have a smooth transition to your Honors Algebra I class in the fall.

You are to submit this packet to your math teacher within the first week of school and it will count as your first grade of the year. Please make sure that you show your work. If you need extra room, please attach any extra pages to your packet and label them with your name and the problem numbers.

If you have trouble on some of the questions, look at the example problems and use the links to see video explanations of each problem type. You may also seek assistance from a parent/guardian or other adult who is strong in math.

Best wishes and we will see you soon!

Sincerely,
Ms. Finkelman and the KHS Math Department

Please fill in the following information when your summer math packet is complete.

Student Name (printed):	Student Signature:	Date:	Approximate Amount of Time Spent Completing the Packet:

Topics: Simplify expressions.

Order of Operations:
https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-negative-numbers-multiply-and-divide/cc-7th-order-of-operations/v/order-of-operations-1

Simplifying with Rational Numbers:
https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-negative-numbers-multiply-and-divide/cc-7th-mult-div-neg-fractions/v/multiplying-negative-and-positive-fractions

https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-negative-numbers-multiply-and-divide/cc-7th-mult-div-neg-fractions/v/dividing-mixed-numbers

Simplify.

1. $4-2(3-2^2)+2(3)^2$
2. $\left(3\frac{2}{3}\right)\cdot\left(-\frac{1}{5}\right)$
3. $4+\left(2\frac{1}{3}\div 3\frac{1}{2}\right)$
4. $3\left(\frac{1}{2}+\frac{4}{3}\right)$

Topics: Solve linear equations in one variable and solve linear equations with rational number coefficients where there is one solution, infinitely many solutions, or no solutions.

Solving simple equations:
https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-equations-and-inequalities/cc-6th-one-step-mult-div-equations/v/simple-equations

Solving Equations:
https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:solve-equations-inequalities/x2f8bb11595b61c86:linear-equations-variables-both-sides/v/equations-3

Number of Solutions:
https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:solve-equations-inequalities/x2f8bb11595b61c86:num-solutions-linear-equations/v/number-of-solutions-to-linear-equations

Linear Equations Word Problems:
https://www.khanacademy.org/math/cc-seventh-grade-math/cc-7th-variables-expressions/cc-7th-linear-eq-word-probs/v/linear-equation-word-problem-example

Solve for the given variable.

5. $x+1=2\frac{1}{5}$
6. $9.4-0.25c=8.6$
7. $8x-2=-9+7x$
8. $1+2n=8+4n$

9. $p - 4 = -9 + p$ 10. $9x - 7 = -7$ 11. $\frac{1}{2}x + 3 = 1\frac{1}{4}x + 3 - \frac{3}{4}x$

12. **CALCULATOR:** Ann buys donuts and bagels for a morning at the park with friends. A donut costs $1.17 and a bagel costs $0.99, If Ann bought 8 donuts and the total cost was $15.30, how many bagels did Ann buy? Write and solve the equation to show your work.

13. **CALCULATOR:** One cell phone plan charges $15 per month plus $0.30 per minute used. A second cell phone plan charges $25 per months plus $0.10 per minute used. Write and solve an equation to find the number of minutes you must talk to have the same cost for both calling plans.

Topic: Use the distributive property and college like-terms when solving linear equations

Distributive Property:

https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:solve-equations-inequalities/x2f8bb11595b61c86:num-solutions-linear-equations/v/equation-special-cases

Solve for the given variable.

14. $12 = -4(-6x - 3)$ 15. $-8 = -(x + 4)$ 16. $5n + 34 = -2(1 - 7n)$ 17. $2(4x - 3) - 8 = 4 + 2x$

Topics: Determine the rate of change (slope) and initial value of a function from a description of a relationship or from two (x,y) values and interpret slope as the unit rate of the graph.

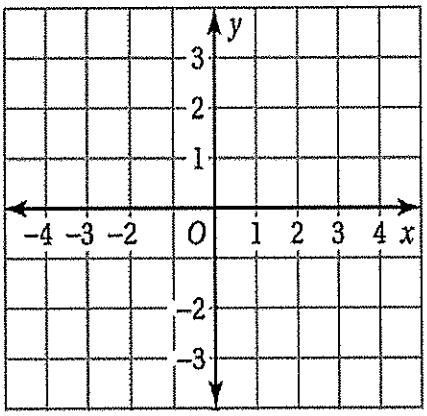
Slope:
https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/8th-slope/v/slope-intuition-example

18. Find the slope of the line containing the points (0, –1) and (5, 6)

19. Determine the slope and y-intercept and graph $y = 3x - 2$

Slope: _____

y-intercept: _____



Topic: Derive the equation $y = mx + b$ for a line given two distinct non-vertical points.
Slope-Intercept From:
https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-linear-equations-functions/8th-slope/v/slope-intuition-example

Write an equation in slope-intercept form ($y = mx + b$) of the line passing through the given points.

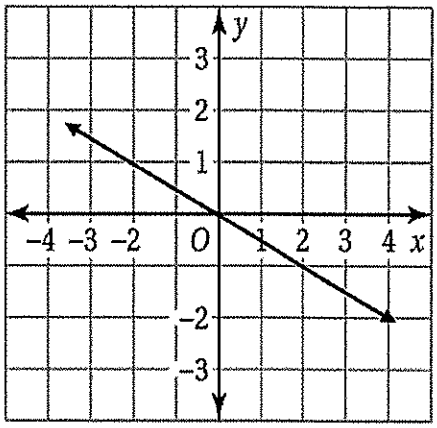
20. $(3,5)$ *and* $(0,4)$

21. $(2,-6)$ *and* $(-4,-2)$

22. $(\frac{1}{2},-1)$ *and* $(3\frac{1}{2},14)$

23. When Phil started his new job, he owed the company $65 for his uniforms. He is earning $13 per hour. The cost of his uniforms is withheld from his earnings. Write an equation that models the total money he has *m* after *h* hours of work.

24. What is the slope of the line? What is the y-intercept?

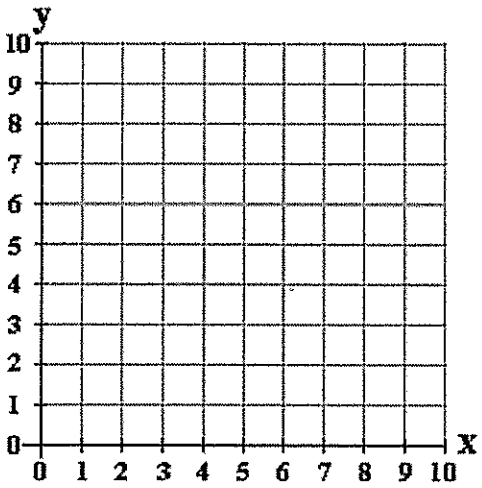


Slope: _____

y-intercept: _____

25. The table shows the cost *y* (in dollars) of *x* cold drinks.

a. Graph the data. Label the axes.



Drinks, *x*	0	2	4	6
Cost, *y*	0	3	6	9

b. What is the slope of the linear function? Interpret the slope in words in context of the situation.

c. What is the y-intercept of the linear function? Interpret the y-intercept in context of the situation.

Topic: Apply properties of integer exponents to generate equivalent numerical expressions

Exponent properties:
https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-exponent-properties/v/exponent-properties-involving-products

Negative Exponents:
https://www.khanacademy.org/math/cc-eighth-grade-math/cc-8th-numbers-operations/cc-8th-pos-neg-exponents/v/negative-exponents

Simplify each expression by using the properties of exponents.

26. $(x^3)^4$ 27. $x^2 \cdot x^3$ 28. $\frac{x^7}{x^3}$ 29. $3x^{-2}$ 30. $4x\left(\frac{2}{x^2}\right)^3$

Topic: Simplify square roots and use square and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$

Exponent properties:
https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:rational-exponents-radicals/x2f8bb11595b61c86:simplifying-square-roots/v/simplifying-square-roots-1

Solving using roots: https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:quadratic-functions-equations/x2f8bb11595b61c86:untitled-1082/v/simple-quadratic-equation

Simplify each expression.

31. $\sqrt{144}$ 32. $\sqrt{162} - 2\sqrt{2}$ 33. $6 - 5\sqrt{\frac{4}{25}}$ 34. $\sqrt{4^2 + 36}$ 35. $\sqrt[3]{16}$

Solve each equation

36. $x^2 - 5 = 20$ 37. $3x^3 = 24$ 38. $2(x-1)^2 = 32$

Topic: One-Variable Statistics. Describe and compare data sets using summary statistics and create and analyze graphical displays of data sets.

Measures of Center:
https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/mean-and-median/v/mean-median-and-mode

IQR:
https://www.khanacademy.org/math/ap-statistics/summarizing-quantitative-data-ap/measuring-spread-quantitative/v/calculating-interquartile-range-iqr?modal=1

Graphical Displays:

Box and Whisker:
https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/cc-6th-box-whisker-plots/v/constructing-a-box-and-whisker-plot

Histogram:
https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/cc-6th-box-whisker-plots/v/constructing-a-box-and-whisker-plot

Mean Absolute Deviation (MAD):
https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-data-statistics/cc-6-mad/v/mean-absolute-deviation

CALCULATOR ALLOWED:

39. Determine the mean, median, mode(s), IQR and range for the data.

4, 5, 7, 7, 7, 8, 10, 11, 11, 13, 13, 14

40. Determine the mean absolute deviation for the price of sandwiches at a local deli.

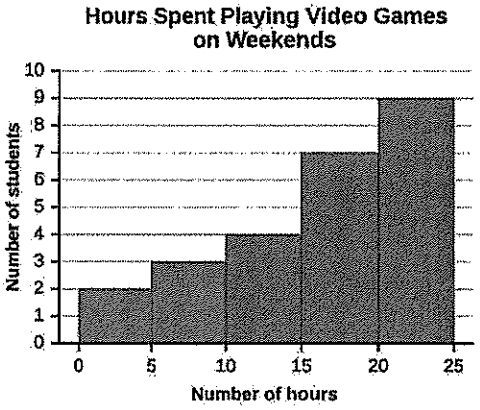
$6.00, $8.95, $7.95, $6.50, $7.50, $5.75, $6.25

41. The ages of people at a concert are 48, 18, 51, 26, 33, 37, 35, 24, 39, 29, 32. Make a stem-and-leave and box-and-whisker plot of the data.

42. Determine whether the questions below are statistical questions. Explain.
    a. What is the capital of Connecticut?

    b. How many students attend your school?

43 – 45 Use the histogram that shows the number of hours spent playing video games on the weekend.

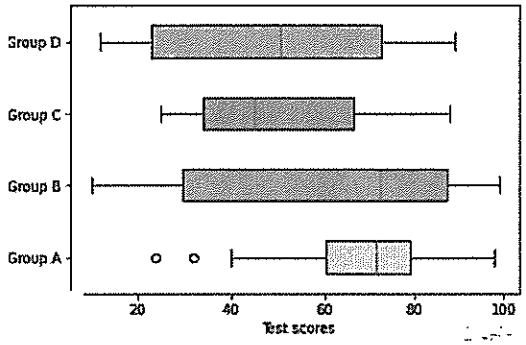


43. Which interval contains the most data?

44. How many students were asked?

45. Determine the percent of students that spend less than 15 hours playing video games on the weekend.

46-48 Use the box-and-whisker plot to answer the questions.



46. Identify the shape of each distribution.

47. What percent for Group A falls at about 50 or higher?

48. What group has the largest range in test scores?

49. Andrew must spend less than $74 on meals during the weekend. He has already spent $29 on meals, with each meal costing $9 on average. An inequality represents Andrew's situation below: $9x + 29 < 74$ How many additional meals can Andrew buy this weekend?

a. $x < 5$
b. $x < 9$
c. $x < 45$
d. $x < 29$

50. The table below shows the cost for a factory to produce mid-sized cars. Based on the information in the table, how much does it cost the factory to produce each car?

Number of Cars Produced	Cost
0	$0.00
3	$16,266.00
5	$27,110.00
6	$32,532.00

51. The table shows the relationship between the weight of a package and the cost of mailing it. Based on the table, how much money will it cost to mail a 13-ounce package?

Weight of Package	Cost
1	$0.37
2	$0.60
3	$0.83
4	$1.06
8	$1.98

52. During the summer, you work 30 hours per week at a gas station and earn $8.75 per hour. You also work as a landscaper for $11 per hour and can work as many hours as you want. You want to earn a total of $400 per week. How many hours must you work as a landscaper?

53. The altitude a (in feet) of a plane t minutes after liftoff is given by $a = 3400t + 600$. How many minutes after liftoff is the plane at an altitude of 21,000 feet?

54. You are saving money to buy a new bicycle that costs $165. You have $30 and plan to save $5 each week. Your aunt decides to give you an additional $10 each week. How many weeks will you have to save until you have enough money to buy the bicycle?

Important: Be sure to bring this packet to school daily for the first two weeks!

1. Which sections of this packet were easiest for you?

2. Which sections were most difficult for you?

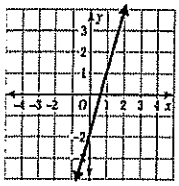
3. What is something your math teacher should know about you?

4. List all help you had to complete this packet. (Parent/guardian/other adult/sibling/website).

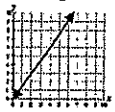
Congratulations! You completed the summer packet! ☺

Answers – Use this page to check your answers here after doing the work! You must show your work for credit!

1. 24
2. -11/15
3. 4 2/3
4. $\frac{11}{2}$ or $5\frac{1}{2}$
5. $x = 1\frac{1}{5}$ or $\frac{6}{5}$
6. $c = 3.2$ or $3\frac{1}{5}$ or $\frac{16}{5}$
7. $x = -7$
8. $n = -\frac{7}{2}$ or $-3\frac{1}{2}$
9. no solution
10. $x = 0$
11. infinitely many solutions.
12. 6 bagels
13. 50 minutes
14. $x = 0$
15. $x = 4$
16. $n = 4$
17. $x = 3$
18. $m = \frac{7}{5}$
19. $m = 3$, $y - int = -2$



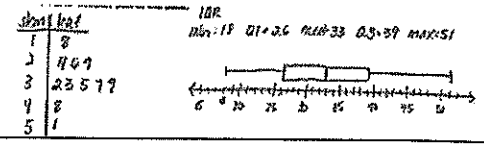
20. $y = \frac{1}{3}x + 4$
21. $y = -\frac{2}{3}x - \frac{14}{3}$
22. $y = 5x - \frac{7}{2}$
23. $m = 13h - 65$
24. slope = $-\frac{1}{2}$ y – intercept = 0
25. a.



b. $m = \frac{3}{2}$ The cost increases $3 per 2 drinks (or $1.50 per drink)

c. y-int = 0 The cost of 0 drinks is $0.

26. x^{12}
27. x^5
28. x^4
29. $\frac{3}{x^2}$
30. $\frac{32}{x^5}$
31. 12
32. $7\sqrt{2}$
33. 4
34. $2\sqrt{13}$
35. $2\sqrt[3]{2}$
36. $x = \pm 5$
37. $x = 2$
38. $x = -3$ or 5
39. mean = 9.16, median = 9, mode = 7 IQR = 12 − 7 = 5
    min = 4, Quartile 1 = 7, median = 9,
    Quartile 3 = 12, max = 14
40. $0.98
41.



42. a. Not statistical (only one answer)
    b. Statistical (many different answers)
43. 20-25
44. 25 students
45. 9/25 = .36 = 36%
46. A = no skew
    B = right skewed
    C = left skewed
    D = left skewed
47. approx. 75%
48. Group B
49. x < 5
50. $5422/car
51. $3.13
52. 12.5 hours
53. 6 minutes
54. 9 weeks