

Name_____

Summer Work for Geometry and Honors Geometry – Part 1

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This year's summer work is divided into 4 roughly equal pieces. The pieces will be made available at regular intervals over the summer.

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Have a great summer.

PART 1: Algebra Review

1. Subtract: $(-1) - (-11)$

[A] 12

[B] -10

[C] -12

[D] 10

2. Evaluate: $(-15) \cdot (-5) + 84 \div (-4)$

3. What is the average percentage of claims settled for the companies in the chart below with the best records?

Businesses with the best and worst records for settling complaints filed with the Better Business Bureau (percentage of claims settled)			
Best		Worst	
Book - record club	90.8%	Carpet cleaners	32.7%
Products ordered from newspapers or magazines	88.4%	Paint and Wallpaper Contractors	44.8%
Banks	87.0%	Paving contractors	46.5%

4. If tomatoes cost \$1.06 per pound, and you paid \$0.93, how many pounds did you purchase?

5. Describe how you would solve the following: $4\frac{1}{3} - 2\frac{2}{5}$.

6. Divide: $\frac{7}{8} \div \left(-\frac{5}{16}\right)$

[A] $-\frac{14}{5}$

[B] $\frac{35}{128}$

[C] $-\frac{35}{128}$

[D] $\frac{14}{5}$

7. Explain how you might estimate the answer to 38.45×52.46 .

8. Using the symbols $<$, $>$, or $=$, compare and order the following: 0.810, 0.081, 0.8, 0.180, 0.82.

9. Jaime has $\frac{5}{11}$ of a project completed while Tim has finished $\frac{7}{13}$ of the same project. Who has completed the greater amount of work?

10. What is the difference between a prime number and a composite number?

11. Show how to use prime factorization to identify the LCM of 18 and 30.

12. Can a number ever be both a factor and a multiple of itself? Explain using examples.

13. Write two equivalent expressions, each consisting of two different factors for t^{11} .

14. Which property is illustrated by the following statement?

$$8 \cdot (6 \cdot 5) = (8 \cdot 6) \cdot 5$$

[A] Associative Property of Addition

[B] Commutative Property of Multiplication

[C] Associative Property of Multiplication

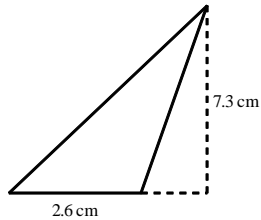
[D] Commutative Property of Addition

15. Which property is illustrated by the following statement?

$$10 \cdot 0 = 0$$

- [A] multiplication property of one
- [B] commutative property of multiplication
- [C] multiplication property of zero
- [D] associative property of multiplication

16. Find the area of this triangle. Formula? $A_{\text{triangle}} = (1/2)(\text{base})(\text{height})$:

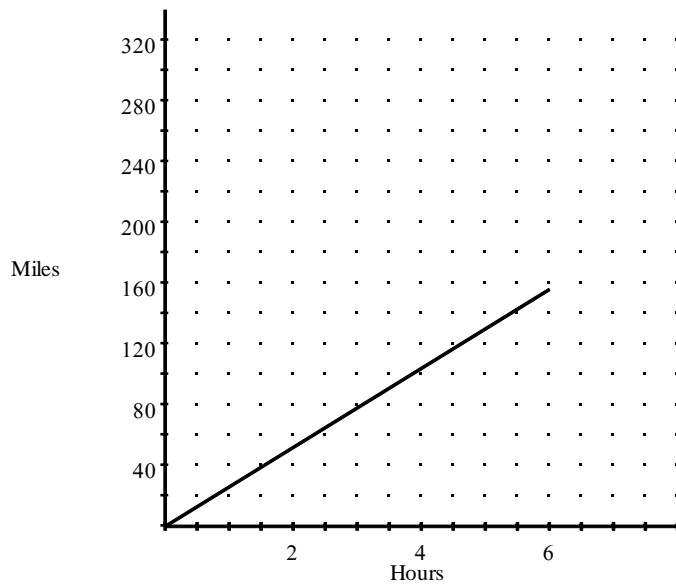


- [A] 18.98 cm^2
- [B] 9.9 cm^2
- [C] 19.8 cm^2
- [D] 9.49 cm^2

17. Find the area of a circle with a diameter of 82 kilometers. Use 3.14 for π . $A_{\text{circle}} = \pi r^2$

18. What is the approximate length of the diameter of a circle that has a circumference of 100 cm? Round to the nearest cm. Circumference = $\pi(\text{diameter})$

19. The figure below represents the distance traveled by a car in 6 hours. Find the speed of the car.

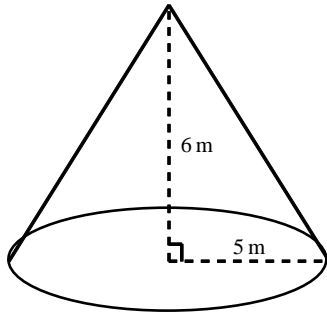


20. Write the ratio as a unit rate. (Cost for one)

\$8.55 for 9 cans

21. A carton was delivered to Wooster School containing 6 boxes of paper. The dimensions of each box of paper were 11 in. by 8 in. by 4 in. What is the smallest possible volume of the carton? $V_{\text{box}} = (\text{length} \times \text{width} \times \text{height})$

22. Find the volume of the cone. The formula is $v = (1/3)(\text{base area})(\text{height})$.



- [A] 26.18 m^3
- [B] 50 m^3
- [C] 157.08 m^3
- [D] 471.24 m^3

23. Two complementary angles have a sum of measures equal to 90 degrees. Twice the complement of an angle is 77° . What is the measure of the angle?

24. Supplementary angles have a sum of 180 degrees. Classify (right, acute, or obtuse) and determine the angle that is supplementary to a 70° angle.

25. Write an algebraic expression for the phrase.

the quotient of 8 times x and 21

[A] $\frac{21x}{8}$

[B] $\frac{8x}{21}$

[C] $\frac{8}{21x}$

[D] $\frac{21}{8x}$

26. Define variables and write an equation to model the relationship in the table. Use linear regression on your calculator, if you would like.

Time	Cost
1 day	\$15
4 days	\$60
7 days	\$105
14 days	\$210

27. Use the formula $C = p + r \cdot p$ to find the total cost of a purchase, where C is the total cost, p is the price, and r is the sales tax rate written as a decimal.

A pair of shoes costs \$59.99. The sales tax rate is 7%.

28. Simplify the expression.

$$13[6^3 \div (5^2 - 4^2) + 9]$$

29. Are whole numbers, integers, or rational numbers the most reasonable for the situation?
the number of desks in a classroom

30. Find the absolute value.

$$|-6.7|$$

31. Simplify.

$$|-7| + 1 + (-2)$$

[A] -8

[B] -9

[C] 6

[D] 10

32. The temperature on a summer afternoon is 83°F . Define a variable and write an expression to find the temperature after it changes. Then, evaluate your expression for a decrease of 15 degrees Fahrenheit.

[A] $15 + c$; $15 + (-83) = 68$

[B] $83 - c$; $83 - (-15) = 68$

[C] $15 - c$; $15 - (-83) = 68$

[D] $83 + c$; $83 + (-15) = 68$

33. Simplify the expression.

$$-1.8 - 6.4$$

[A] -4.6

[B] -8.2

[C] 8.2

[D] 4.6

34. On Thursday, the closing price of a Company B share was \$72.31. It had risen \$1.19 from the previous day. Find the closing price of a Company B share on Wednesday.

[A] \$73.50

[B] \$71.12

[C] \$71.21

[D] \$73.05

35. Evaluate $\frac{p}{q} + 3p$, for $p = -21$ and $q = 7$

[A] 66

[C] -66

[B] 70

[D] -70

PART II:

One of the great geometers of all time is Euclid. Do 20 minutes of research on this man and then write a short biography/fact sheet for 20 minutes about him. Cite at least 3 sources (not Wikipedia!) using "MLA format."

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Summer Work for Geometry and Honors Geometry – Part 2

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Assignment II:

Part I: Algebra Review

36. Evaluate the expression for $m = -4$, $n = 2$, $p = 1.5$.

$$(3m + n) \div (n + 2p)$$

37. Simplify the expression.

$$-(6x - 5)$$

[A] $-6x - 5$

[B] $6x - 5$

[C] $-6x + 5$

[D] $6x + 5$

38. Tell whether the expressions are equivalent. Explain.

$$ab + cd \text{ and } ba + dc$$

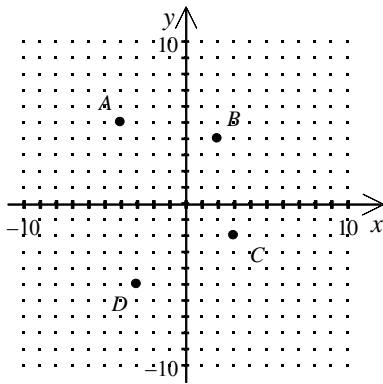
[A] Yes, they are because_____.

[B] No, they are not because_____.

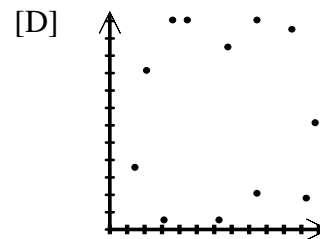
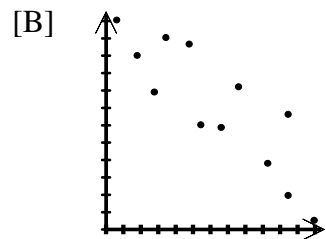
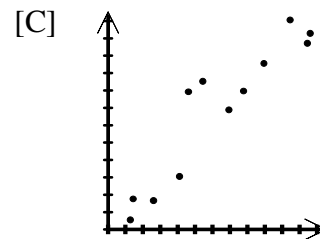
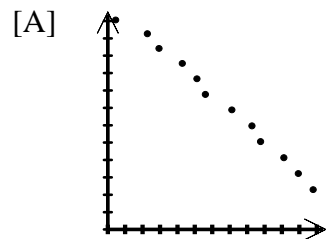
39. Simplify the expression. Justify each step.

$$13x - 4 + 9x$$

40. Name the coordinates of the points A , B , C , and D . Remember the order is (x, y) .



41. Which of the scatter plots shows a positive correlation?



42. Solve the equation below. (negative \times negative = ?; negative \times positive = ?)

$$-5x = -15$$

[A] 3

[C] $\frac{1}{3}$

[B] 75

[D] $\frac{1}{75}$

43. Define a variable and write an equation for the situation. Then solve.

A customer went to a garden shop and bought some potting soil for \$12.50 and 6 shrubs. If the total bill was \$71.00, what did the shrubs cost?

44. Justify each step. What you are doing is practicing algebraic proofs. We will do some of these next year and many purely geometric proofs. Geometric proofs often have algebraic steps.

a. $23 = -4x + 11$

b. $23 - 11 = -4x + 11 - 11$

c. $12 = -4x$

d. $\frac{12}{-4} = \frac{-4x}{-4}$

e. $-3 = x$

45. Write an equation to model the situation. Solve and check the reasonableness of your solution.

Two students are going to the sandwich shop for lunch. They pay \$1.35 for a soda and buy one whole turkey sandwich and one half turkey sandwich. The total bill is \$8.79. What is the price of the whole sandwich?

46. Solve the equation. Check your solution.

$$3.4 = -13.6 + -3.4c + 1.7c$$

[A] -10

[B] -8

[C] 2

[D] -4

47. Write and solve an equation for the situation.

A disposable camera manufacturer spends \$2250 each day for overhead expenses plus \$9 per camera that it manufactures for labor and materials. The cameras sell for \$15 each. How many cameras must the company sell in one day to equal its daily costs?

48. Solve the equation. An “*identity*” is an equation that works for all values of the variable, like $x = 2x - x$. If the equation is an identity, write *identity*. If it has no solution, write *no solution*.

$$10x + 9 = x + 9(2 + x)$$

49. The sum of three consecutive *even* integers is 108. What are the integers? You may not use Guess and check for this!

[A] 34, 36, 38

[B] 36, 38, 40

[C] 32, 36, 38

[D] 32, 34, 36

50. Solve the equation for a .

$$4a + 2 = 3b - 5$$

[A] $\frac{4a - 7}{3}$

[B] $\frac{3b + 7}{4}$

[C] $\frac{3b - 7}{4}$

[D] $\frac{4a + 7}{3}$

51. Rewrite the inequality so that the variable is on the left. Then graph the solution.

$$3 \leq x$$

Solve the inequality. Show steps always!

$$52. \frac{1}{2} + x + \frac{2}{3} \leq \frac{7}{6}$$

$$[A] \ x \leq \frac{1}{3}$$

$$[B] \ x \leq 0$$

$$[C] \ x \leq -\frac{1}{6}$$

$$[D] \ x \leq \frac{7}{6}$$

$$53. -\frac{9}{20}z \leq \frac{19}{10}$$

$$[A] \ z \geq -4\frac{2}{9}$$

$$[B] \ z \geq \frac{19}{90}$$

$$[C] \ z \geq -\frac{19}{1800}$$

$$[D] \ z \leq -4\frac{2}{9}$$

$$54. -0.3n \leq 5.4$$

$$[A] \ n \leq -1.8$$

$$[B] \ n \leq -1.62$$

$$[C] \ n \geq -18$$

$$[D] \ n \geq -16.2$$

55. $0 > x - 2 - 3(x - 6)$

[A] $x > 8$

[B] $x < -8$

[C] $x < 8$

[D] $x < 7$

56. $8b - 10 \leq 9b + 15$

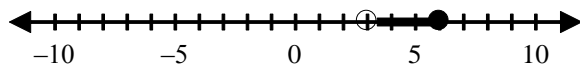
[A] $b \geq -25$

[B] $b \leq 25$

[C] $b = -\frac{25}{17}$

[D] $b \geq \frac{5}{17}$

57. Find a compound inequality that the graph could represent.



[A] $3 < x \leq 6$

[B] $3 \leq x < 6$

[C] $x < 3$ or $x \geq 6$

[D] $x \leq 3$ or $x > 6$

58. Solve the compound inequality.

$$2x - 6 < -12 \text{ or } 3x + 5 > 2$$

[A] $x < -3$ or $x > -1$

[B] $x > -3$ or $x < -1$

[C] $x > 3$ or $x < 1$

[D] $x < 3$ or $x > 1$

59. Solve and graph the solution.

$$|2x + 1| > 3$$

60. Solve the proportion.

$$\frac{x - 3}{8} = \frac{4}{9}$$

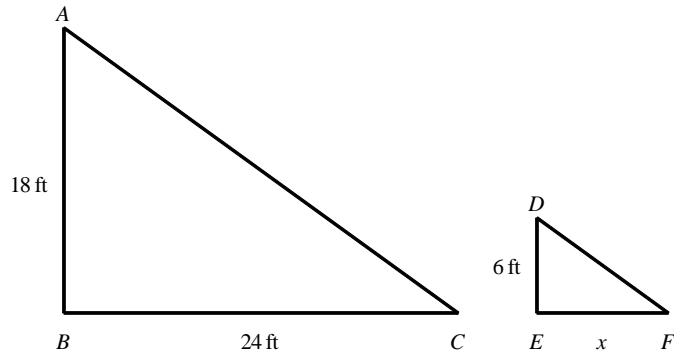
[A] 59

[B] $\frac{9}{59}$

[C] $\frac{5}{9}$

[D] $\frac{59}{9}$

61. The pair of figures is similar. Find the missing length.



[A] 18 ft

[B] 8 ft

[C] 10 ft

[D] 26 ft

62. Write an equation to model the question and solve.

17 is what percent of 38?

[A] $38 = 17 \cdot 100n$; 223.53%

[B] $38 = 17n$; 2.24%

[C] $38n = 17$; 44.74%

[D] $n = 17 \cdot 38$; 646%

63. During the month of February, 24-7 Food World sold 25 bottles of energy drink. After an ad campaign to boost sales, they sold 45 bottles in March. Find the percent of increase in sales.

[A] 105%

[B] 80%

[C] 20%

[D] 5%

64. Dan is in the bicycling club. There are 27 students in the club. Five of them will be picked at random to attend an awards banquet. What is the probability that Dan will **not** be picked to attend the banquet?

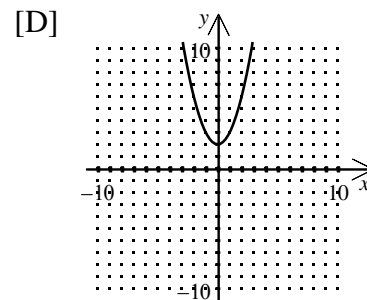
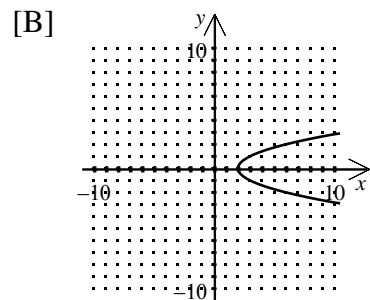
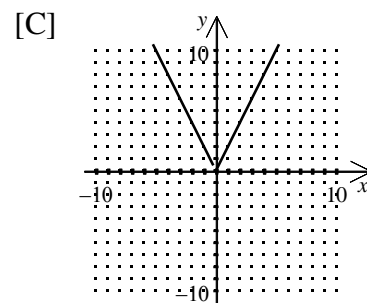
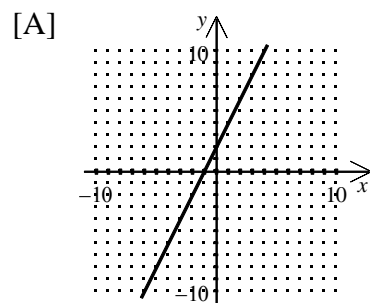
[A] $\frac{27}{5}$

[B] $\frac{5}{27}$

[C] $\frac{22}{27}$

[D] $\frac{27}{22}$

65. Use the vertical-line test to determine which graph does *not* represent a function.



Part II:

Vocabulary Hunt

Geometry is full of words used in different ways than they are in non-technical English. Confusingly, geometry even uses the same word in multiple ways in some cases.

Please look up these geometric terms. Make a drawing or explain each. Label diagrams clearly.

1. **Right** Triangle, **Acute** triangle, **Obtuse** triangle

2. **Vertical** angles

3. **Complementary** angles

4. **Exterior** Angle

5. **Median** of a triangle versus **median** of a trapezoid

6. **Inverse** of a statement

7. **Similar** figures

8. **Corresponding** angles (when two lines are cut by a third)

9. **Corresponding** parts (of congruent figures)

10. **Tangent** line

11. **Tangent** of an angle (in a right triangle)

12. A **chord**

13. **Opposite** angles in a quadrilateral

14. **Opposite** rays

15. An **inscribed** angle

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Assignment III:

Part 1: Algebra Review

66. Find the range of the function rule $y = -5x + 9$ for the given domain.

$$\{-8, -3, 0, 4, 6\}$$

67. A morning glory in Julia's garden was 12 centimeters tall when it was first planted. Since then, it has grown approximately 1.5 centimeters per day.

- a. Write a rule to describe the function.
- b. Estimate the morning glory's height after 5 days.
- c. After how many days will the morning glory be 27 centimeters tall?

[A] a. $H(d) = 12d + 1.5$

b. 61.5 centimeters

c. 13 days

[B] a. $H(d) = 1.5d$

b. 7.5 centimeters

c. 11 days

[C] a. $H(d) = 1.5 + 12$

b. 13.5 centimeters

c. 12 days

[D] a. $H(d) = 1.5d + 12$

b. 19.5 centimeters

c. 10 days

68. Graph the function. You may use your calculator's graphing capabilities.

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

69. Write an equation of the direct variation ($y = kx$) that includes the given point.

$$\left(2, \frac{12}{5} \right)$$

70. The distance a spring will stretch x varies directly with a weight W attached to the spring ($x = kW$). If a spring stretches 4.4 inches with 40 pounds attached, how far will it stretch when 90 pounds is attached?

[A] 396 in.

[B] 0.11 in.

[C] 9.9 in.

[D] 1.22 in.

71. Find the next two terms in the sequence.

2, 7, 24.5, 85.75, . . .

72. Is the given sequence arithmetic (are the increases or decreases steady)? Justify your answer.

3, 9, 27, 81, . . .

73. Find the slope of the line that passes through the pair of points.

$(a, b), (c, d)$

[A] $\frac{b - d}{c - a}$

[C] $\frac{a - c}{d - b}$

[B] $\frac{d - b}{c - a}$

[D] $\frac{a - c}{b - d}$

74. Find the slope and y-intercept of the equation. ($y = mx + b$)

$$6x - 3y = 36$$

[A] $m = -2, b = 12$

[B] $m = -12, b = \frac{1}{2}$

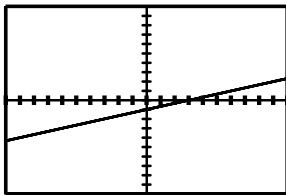
[C] $m = 12, b = -\frac{1}{2}$

[D] $m = 2, b = -12$

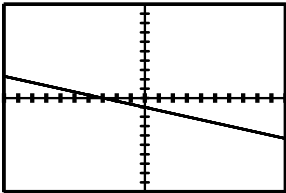
75. Match the equation with the best choice for its graph.

$$y = -3x - 1$$

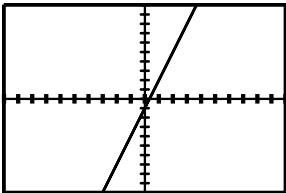
[A]



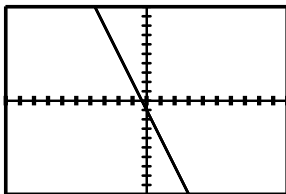
[B]



[C]



[D]



76. Graph the equation using x - and y -intercepts.

$$5x + 8y = 40$$

77. Is the relationship shown by the data *linear*? Model the data with an equation.

Time (months)	Plant Height (inches)
3	3.6
5	5.4
7	7.2
9	9.0

[A] The relationship is linear.

$$y - 5.4 = 0.9(x - 5)$$

[B] The relationship is linear.

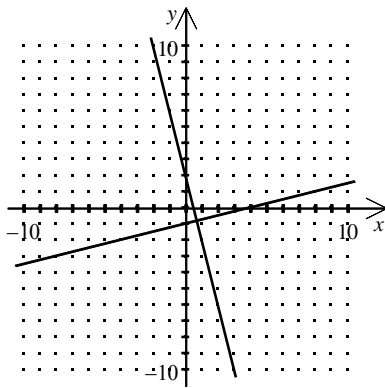
$$y - 7 = 3.6(x - 7.2)$$

[C] The relationship is linear.

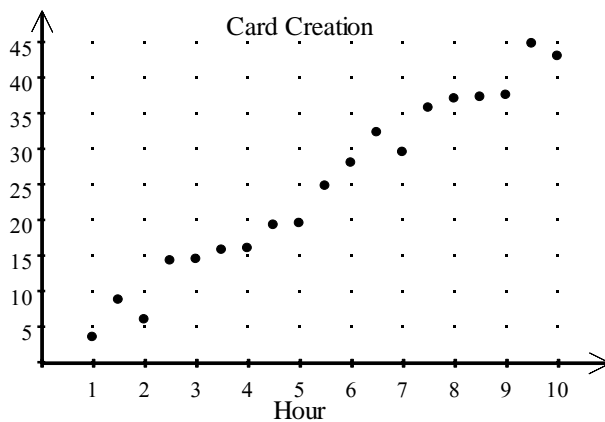
$$y - 3 = 1.8(x + 3.6)$$

[D] The relationship is not linear.

78. Find the equation for each line. What relationship exists between the slopes of the two lines?



79. Michael started making homemade cards to send to friends and family and to sell at the local craft fair. The scatter plot shows how many cards Micah made each hour he worked. Find an equation of a reasonable trend line for the scatter plot. Predict the number of cards Micah can make in hour 14. (You may use linear regression to make your prediction.)



80. Write an equation for each translation of $y = -|x|$.

- 3 units up
- 6.4 units right

81. Without graphing, decide whether the system has *one solution*, *no solution*, or *infinitely many solutions*. Explain.

$$y = -3x + 4$$

$$y = 3x + 8$$

82. Solve the system using substitution.

$$g - 2h = 0$$

$$h = -3g + 7$$

[A] $\left(1, \frac{1}{2}\right)$

[B] $(1, 0)$

[C] $(3, -2)$

[D] $(2, 1)$

83. Solve by elimination.

$$2x - y = -3$$

$$4x + y = 15$$

[A] $(9, 3)$

[B] $(7, 2)$

[C] $(3, 9)$

[D] $(2, 7)$

84. Tickets to a local movie were sold at \$3.00 for adults and \$1.50 for students. There were 540 tickets sold for a total of \$1305.00. Solve by elimination to find the number of adult tickets sold and the number of student tickets sold.

[A] 210 adult and 330 student

[B] 320 adult and 220 student

[C] 330 adult and 210 student

[D] 220 adult and 320 student

85. A motorboat can go 14 miles downstream on a river in 20 minutes. It takes 30 minutes for this boat to go back upstream the same 14 miles. Find the speed of the current. [Use $d = (r+c)t$ and $d = (r-c)t$]

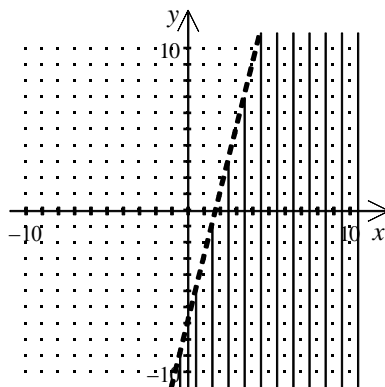
[A] 7 mph

[B] 28 mph

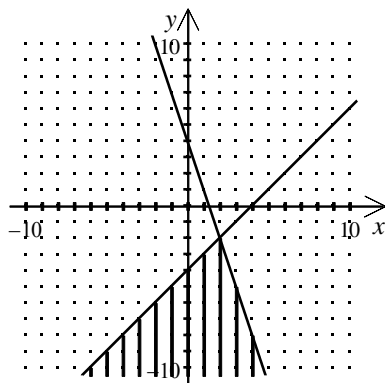
[C] 42 mph

[D] 35 mph

86. Write the inequality shown in the graph.



87. Write a system of inequalities for the graph.



[A] $y \leq x - 4$

$3x + y \leq 4$

[B] $y \geq x - 4$

$3x + y \geq 4$

[C] $y \leq x + 3$

$-4x + y \geq 4$

[D] $y \geq x + 3$

$-4x + y \leq 4$

88. Simplify the expression.

$$8x^0y^{-1}$$

89. Evaluate the expression for $x = 2$ and $y = -4$.

$$\frac{1}{2^{-2}x^{-3}y^5}$$

90. Write the number in scientific notation.

0.00624

91. Astronomers measure large distances in light-years. One light-year is the distance that light can travel in one year, or approximately 5,880,000,000,000 miles. If a star is 13.1 light-years from Earth, which expression in scientific notation correctly represents how far the star is from Earth?

[A] 5.90×10^{12} miles

[B] 7.70×10^{13} miles

[C] 77.0×10^{12} miles

[D] 7.80×10^{13} miles

92. Simplify the expression.

$$-4x^3 \cdot 2y^{-2} \cdot 5y^5 \cdot x^{-8}$$

[A] $-\frac{x^5}{40y^3}$

[B] $-\frac{2x^5}{5y^3}$

[C] $-\frac{5y^3}{2x^5}$

[D] $-\frac{40y^3}{x^5}$

93. Simplify the expression. Write the answer in scientific notation.

$$(0.4 \times 10^{-6})(0.7 \times 10^{-2})$$

[A] 2.8×10^{-9}

[B] 2.8×10^{-8}

[C] 28×10^{-9}

[D] 0.28×10^{-8}

Simplify the expression.

94. $d^2(d^4)^5$

[A] d^{13}

[B] d^{11}

[C] d^{18}

[D] d^{22}

Simplify the expression.

95. $-3x^3 + (3x)^3$

[A] $12x^3$

[B] $24x^3$

[C] 0

[D] $6x^3$

96. Simplify the quotient. Write the answer in scientific notation.

$$\frac{2.28 \times 10^3}{3.8 \times 10^8}$$

[A] 6×10^{-5}

[B] 6×10^{-4}

[C] 6×10^4

[D] 6×10^{-6}

Part II:

Architectural Drawings and “Blueprints”

In the past, when architects made drawings of buildings or other structures, they used special blue paper, hence the word “blueprint” entered the language to mean “plan” in both a physical sense and a figurative sense.

Today, architects and their assistants use software called CAD (= Computer Aided Design) to do their renderings.

Please read about [GOOGLE SKETCHUP](#), and download the program to a computer of your choosing. Then, play with it for a while.

Write about your adventure with sketchup as if you were reviewing the product and its documentation for a newspaper. Print a drawing you created with it.

Name_____

Summer Work for Geometry and Honors Geometry – Part 4

Dear Students,

I hope you are all having a wonderful and relaxing summer.

This year's summer work is divided into 4 roughly equal pieces. The pieces will be made available at regular intervals over the summer.

This review will help me assess your strengths and weaknesses entering the class. It will also introduce you to how algebra and geometry can work together. I strongly recommend working on this packet in 45-minute to one-hour sittings, spread out over the summer, roughly once a week.

Some things to keep in mind while you are working:

1. All work is to be completed and turned in on the first day of class.
2. All work is to be done in pencil in the space provided in the packet.
3. **SHOW STEPS FOR EVERY PROBLEM. No credit will be awarded for simply circling an answer.** I am interested in process and accuracy.
4. You may use your notes, texts, and online resources to do these problems, but please don't ask anyone other than me for help. Calculators are legal where stated!
5. Grades will be based on effort, not correctness.
6. The grade you earn will play a significant role in your first marking period grade and effort grade.
7. Some of the questions may cover topics you have not seen. That is to be expected. Just make your best written attempt on each problem, and you'll get a high grade!

Have a great summer, and I will see you all soon!

Assignment 4: Last Algebra Review

97. Write the expression with only one exponent.

$$\frac{8a^9}{125a^6}$$

[A] $\frac{8}{125a^3}$

[B] $\left(\frac{2}{5a}\right)^3$

[C] $\frac{8a^{-3}}{125}$

[D] $\left(\frac{2a}{5}\right)^3$

98. Simplify the difference. Write the answer in standard form.

$$(2w^2 - 7w - 1) - (w^2 - 6w - 8)$$

[A] $w^2 - w - 9$

[B] $w^2 + w + 7$

[C] $w^2 - 13w - 9$

[D] $w^2 - w + 7$

99. Factor the polynomial.

$$14x + 8$$

100. Multiply these polynomials. Use the vertical method, please.

$$(7x - 2)(5x^2 - 5x - 2)$$

101. Find the square: $(3x - 6y^2)^2$

[A] $9x^2 - 36xy^2 + 36y^4$

[B] $9x^2 + 36y^4$

[C] $9x^2 - 6xy^2 + 36y^4$

[D] $9x^2 - 18xy^2 + 36y^4$

102. Find the product.

$$(e^2 + 7f)(e^2 - 7f)$$

Factor the expression.

103. $q^2 - 10q + 24$

[A] $(q - 4)(q - 6)$

[C] $(q + 4)(q - 6)$

[B] $(q + 4)(q + 6)$

[D] $(q - 4)(q + 6)$

Factor the expression.

104. $20x^2 + 42x - 20$

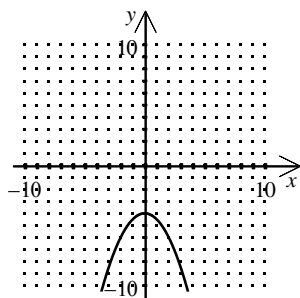
105. $4x^2 - 20x + 25$

106. $128x^2 - 392$

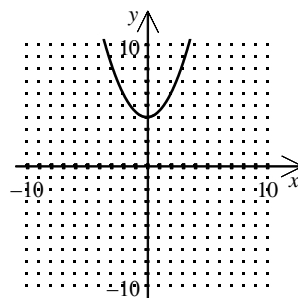
107. Identify the graph of the function. Use your calculator freely.

$f(x) = 0.5x^2 - 4$

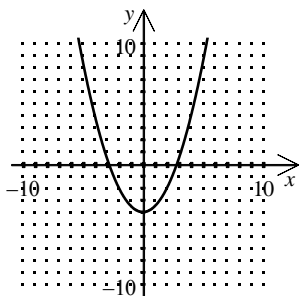
[A]



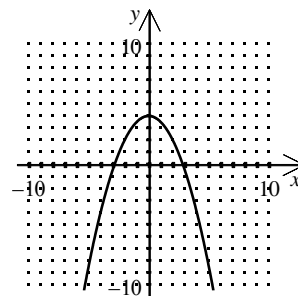
[C]



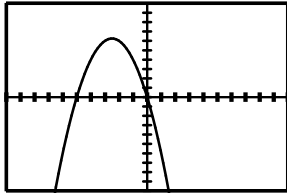
[B]



[D]



108. Match the graph with its function. Use your calculator, if you wish.



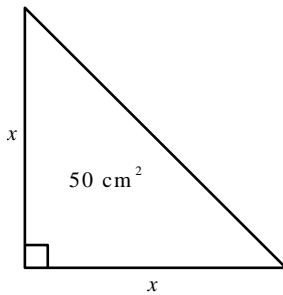
[A] $y = -x^2 - 5x$

[B] $y = -x^2 - 5$

[C] $y = x^2 + 5$

[D] $y = x^2 + 5x$

109. Find the value of x for the triangle. If necessary, round to the nearest tenth. (Have you made friends with Pythagoras?)



110. Solve by factoring.

$$3m^2 - m = 4$$

111. Solve the equation by completing the square. If necessary, round to the nearest hundredth.

$$x^2 + 6x - 27 = 0$$

112. Use the quadratic formula to solve the equation. If necessary, round answers to the nearest hundredth. ($x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$, if $ax^2 + bx + c = 0$)

$$3x^2 + 2x - 4 = 0$$

[A] 1.54, -0.87

[B] 2.74, -2.07

[C] 0.87, -1.54

[D] 2.07, -2.74

113. Simplify the radical expression.

$$\sqrt{12q^4r^{10}s^5}$$

[A] $\sqrt{3s}$

[B] $2q^2|r|^5s^2$

[C] $2q^2|r|^5s^2\sqrt{3s}$

[D] $12\sqrt{3s}$

114. Simplify the radical expression by rationalizing the denominator.

$$\frac{13}{\sqrt{5}}$$

[A] $13\sqrt{5}$

[B] $\frac{13\sqrt{5}}{5}$

[C] $\frac{13\sqrt{5}}{25}$

[D] $\frac{\sqrt{13}}{5}$

115. For the values given, a and b are legs of a right triangle, and c is the hypotenuse. Find the length of the missing side of the right triangle. If necessary, round to the nearest hundredth.

$$b = 11, a = 14.25$$

116. Which set of side lengths does not form a right triangle?

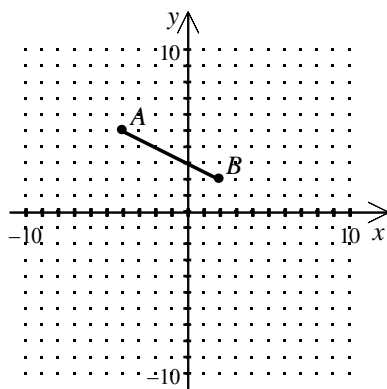
[A] 9, 12, 15

[B] 10, 12, 15

[C] 18, 24, 30

[D] $\frac{9}{2}, 6, \frac{15}{2}$

117. Find AB . Round to the nearest tenth.



[A] 6.9 units

[B] 6.7 units

[C] 9.0 units

[D] 9.2 units

118. CD is the diameter of a circle. The coordinates of C are $(-5, 6)$ and the coordinates of D are $(9, -1)$. Find the center of the circle.

[A] $\left(7\frac{1}{2}, \frac{1}{2}\right)$

[B] $\left(2\frac{1}{2}, -3\right)$

[C] $(-5, -1)$

[D] $\left(2, 2\frac{1}{2}\right)$

119. Simplify the expression.

$$\sqrt{32} + \sqrt{72}$$

[A] $\sqrt{104}$

[B] 10

[C] $10\sqrt{2}$

[D] 48

120. Solve the radical equation. Check your solution.

$$\sqrt{x + 25} - 5 = -x$$

[A] -9

[B] 0

[C] 11

[D] -9, 11

121. Solve the radical equation. Check your solution. If there is no solution, write *no solution*.

$$\sqrt{x + 30} = x$$

122. The pair of points is on the graph of an inverse variation. Find the missing value.

$(x, 8)$ and $(16, 5)$

123. Do the data in the table represent a direct variation ($y = kx$) or an inverse variation ($y = k/x$)? Write an equation to model the data in the table.

x	3	5	8	12
y	6.4	3.84	2.4	1.6

[A] direct variation; $y = \frac{19.2}{x}$

[B] inverse variation; $xy = 19.2$

[C] direct variation; $y = 2.13x$

[D] inverse variation; $y = \frac{2.13}{x}$

124. Simplify the rational expression. [Remember that $4 - z = -(z - 4)$.]

$$\frac{x^2 + 5x - 24}{3 - x}$$

125. FACTOR THE HECK OUT OF EVERYTHING! Then, multiply.

$$\frac{x^2 - 81}{4x} \cdot \frac{7x}{x + 9}$$

[A] $\frac{7(x + 9)}{4}$

[B] $\frac{7(x - 9)}{4}$

[C] $\frac{(x - 9)^2(x + 9)}{28x^2}$

[D] $\frac{(x + 9)^2(x - 9)}{28x^2}$

FACTOR THE HECK OUT OF EVERYTHING! Then, divide.

126. $\frac{x^2 + 9x + 18}{x^2 - 9} \div \frac{x + 6}{x - 6}$

[A] $\frac{9x + 6}{3}$

[B] $\frac{x + 3}{x - 3}$

[C] $\frac{x - 6}{x - 3}$

[D] $\frac{x + 3}{x - 6}$

Divide using polynomial long division (Look it up, if need be).

127. $(7x^2 - 2x^3 + 6 - 9x) \div (2x - 1)$

[A] $-x^2 - 3x + 2 + \frac{4}{2x - 1}$

[B] $-x^2 + 3x - 2 + \frac{4}{2x - 1}$

[C] $-x^2 + 3x - 3 + \frac{3}{2x - 1}$

[D] $-x^2 - 3x + 3 + \frac{3}{2x - 1}$

128. Add or subtract.

$$\frac{x}{x^2 - 25} - \frac{5}{x^2 - 25}$$

Solve the equation. Check your solution.

129. $\frac{12}{x^2 - 36} - \frac{1}{x - 6} = 1$

[A] $x = -7$

[B] $x = 6, -7$

[C] $x = 0$

[D] $x = -7, 0$

Solve the equation. Check your solution.

130. $-\frac{6}{x} + \frac{6}{x-3} = 1$

[A] $x = -3$

[B] $x = 7$ or -2

[C] $x = 6$ or -3

[D] $x = -2$

131. Add or subtract.

$$\frac{x^2 - 3x - 4}{x^2 + 6x + 5} - \frac{1}{x + 5}$$

Part 2: Renovation Time

Go online and find floor plans for a house which would cost from \$350,000 to \$750,000 in Fairfield County. Don't forget to cite sources!

Now, imagine that the family living there has received news that a grandparent needs to move in with them. In each case, your architectural job is to propose an addition to the house which will serve to meet the needs of that elderly person. The room or rooms proposed must attach to the house in some way. You may redesign interior space, if that seems the best solution. Please do not plan to build anything out of keeping with the original house in terms of size.

Your job is to make a drawing of the original space and of the additional space & other alterations needed using any free online software, not by hand. Sketchup is one such tool you might consider.

Also, for extra credit, please estimate the cost of your plans and how you arrived at it.