

SUMMER ALGEBRA REVIEW PACKET FOR HONORS GEOMETRY

Do on binder and graph paper. Show all your work!

On this packet leave all fractional answers in improper fractional form (except where appropriate in word problems) and radical answers in simplified radical form. Calculators are allowed ONLY on the word problems.

1. Simplify the expression $x(2-x) - x(3-x)$.

Find the quotient, simplified:

2. $\frac{12}{-\frac{4}{9}}$ 3. $\frac{-42-18x}{-6}$

4. Which property is shown: $(7 \cdot 5) \cdot 4 = 7 \cdot (5 \cdot 4)$

5. You have \$40.00. You wish to buy a T-shirt costing \$14.50. You would also like to buy a pair of jeans. There is a 6% sales tax on clothing. What is the top price (excludes sales tax) you could pay for the jeans?

Solve:

6. $2x - | -5 | = 23$ 7. $-8n + 20 + 10n = 42$

8. $4n - 2(3-n) = -13$ 9. $\frac{3y+2}{4} = 7$

10. $\frac{x}{2} + \frac{x}{4} = 5$ 11. $\frac{3}{12}y + 18 = 0$

12. $\frac{5}{2} - x(x+1) = x(2-x)$

13. $3x + 17 - 5x = 12 - (6x + 3)$

14. $7x - 29 - 21x = 3 - (12 + 2x)$

15. $3(a+8) = 9[a - (6-a)]$

16. One movie rental club charges \$25 to become a member and \$2.50 to rent each movie. Another charges no membership fee, but charges \$3.25 to rent each movie. How many movies must you rent to make the first club more economical?

17. Solve for e : $c = \frac{d-e}{e}$

18. Which point, $\left(\frac{5}{2}, 3\right)$ or $\left(\frac{3}{2}, 20\right)$, is on the graph of $2x - \frac{2}{3}y = 3$?

19. Write the equation of the line passing through $(2, -7)$, $(2, 0)$, and $(2, 5)$ and state the slope.

20. Write the equation of the horizontal line passing through the point $(4, 7)$ and state the slope.

21. Write the slope-intercept form of the equation of the line passing through the point $(3, -5)$ and perpendicular to the line $y = 2x - 5$.

22. State the x- and y-intercepts of $y = -6x + 7$.

Find the slope of the line through the points:

23. $(-1, -3)$ and $(-1, 7)$ 24. $(-6, 7)$ and $\left(\frac{5}{2}, 1\right)$

25. Rewrite the equation in slope-intercept form.
 $5x - 2y - 7 = 0$.

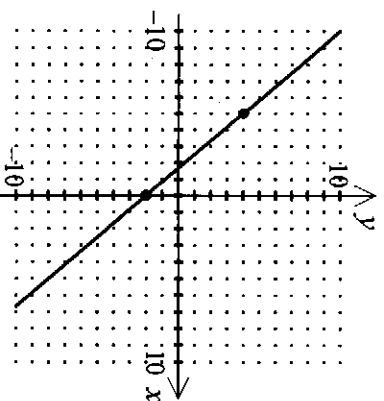
26. Solve for y in $8x + 5y = -2$. Determine if the line is parallel to $y = -\frac{9}{5}x - \frac{8}{7}$.

27. Is the relation $(-3, -1)(-3, 6)(6, -5)$ a function?

28. Decide whether the information defines a function. If it does, state the domain of the function.

input	a	b	c	d
output	0	1	0	1

29. Write an equation of the line shown in slope-intercept form.



30. The cost of a school banquet is \$70 plus \$12 per person attending. Determine the linear equation that models this problem. What is the cost for 89 people?
31. Find an equation of a line that passes through the point $(3, -2)$ with a slope of $\frac{3}{2}$.
32. Write an equation for the line, in slope-intercept form, that passes through the points $(3, -4)$ and $(2, 6)$.
33. Write $y = -\frac{5}{6}x - \frac{4}{3}$ in standard form.
34. Write $y = \frac{2}{3}x - 4$ in standard form.
35. A grocery store knows that if it sells its canned hams for \$5 each, it can sell 750 per month, and if it sells the same hams for \$9, it will sell 600 per month. Assuming the relationship between price and sales is linear, write the equation you could use to predict sales for other prices.
36. Solve and graph solution to the inequality:
 $4x + 5 > 2(x - 1)$
- Solve:*
37. $2 - \frac{1}{3}x > 3$ 38. $-2 < 1 - 2x \leq 2$
39. $-9 \leq -3x - 15 \leq 12$
40. $|x - 2| - 2 = 7$ 41. $|x + 4| < 7$
42. Graph of the inequality: $-2x - 1 < -5$
43. Is the ordered pair $\left(\frac{2}{3}, -\frac{3}{2}\right)$ a solution of the inequality $3x - 2y \leq 5$?
44. Graph: $2x - 3y > -6$
45. A wholesaler has \$75,000 to spend on certain models of TV sets and DVD players. If the TV sets may be obtained at \$375 each and the DVD players at \$215 each, write an inequality that restricts the purchase of x TVs and y DVD players.

46. What are the mean, median, and mode of the data in the following sample?
 7, 16, 1, 16, 13, 16, 11, 16, 9, 15

47. Graph: $x + y = -1$
 $2x - y = 7$

48. Use substitution to solve the linear system.
 $x - 4y = 6$
 $2x + y = -4$

49. The length of a rectangle is 1 cm more than four times the width. If the perimeter of the rectangle is 22 cm, what are its dimensions?

Solve the systems:

50. $3x - 4y = 21$ 51. $2x + 5y = 7$
 $4x + 2y = 6$ $-4x - 10y = 2$

52. $-2x + 4y = 10$ 53. $5x - 2y = 3$
 $3x - 6y = -15$ $-x + 6y = -2$

54. $6x - 3y = -1$
 $2x + 5y = 1$

55. Determine if the system has no solutions, one solution, or many solutions $2x - 3y = 0$ $4x - 6y = 0$
56. Marc sold 497 tickets for the school play. Student tickets cost \$4 and adult tickets cost \$5. Marc's sales totaled \$2283. How many of each type of ticket did Marc sell?
57. The sum of the ages of Petra and her mother is 48. Her mother is 9 years more than twice as old as Petra. How old are Petra and her mother?
58. x pounds of candy valued at \$3.50 per pound is mixed with y pounds of candy valued at \$4.30 per pound to produce 10 pounds of a mixture selling for \$4 per pound. Find x and y , the number of pounds of each type.
59. The Modern Grocery has cashews that sell for \$4.50 a pound and peanuts that sell for \$2.50 a pound. How much of each must the grocer mix to get 80 pounds of mixture that he can sell for \$3.00 per pound? Write a system of linear equations and solve.

60. You can work a total of no more than 37 hours per week at your two jobs. Housecleaning pays \$8 per hour, and your sales job pays \$7 per hour. You need to earn at least \$281 per week to cover your expenses. Write a system of inequalities that shows the various numbers of hours you can work at each job.

61. Graph the system of linear inequalities.
 $y \geq 2x + 2$
 $y \leq 3$

Simplify: (Remember NO negative exponents allowed in final answers.)

62. $(-3x^{-2}y^0)^{-3}$ 63. $(2x)^4(3x^3)^2$.
64. $\frac{1}{9x^{-2}y^{-1}}$ 65. $(-2)^0(3x^{-2}y^{-2})^{-1}$
66. $\frac{-20x^5y^3}{-4x^2y^6}$ 67. $\frac{8x^2y^{-2}}{x^{-2}y} \bullet \frac{(4xy^2)^{-1}}{x^2y}$
68. $\frac{32xy^3}{-8x^3y} \bullet \frac{-2xy}{-4y}$ 69. $\frac{5x^3y^{-1}}{x^{-2}y^2} \bullet \frac{(5x^2y)^{-1}}{xy^{-1}}$
70. Solve: $64x^2 - 49 = 0$

Simplify:

71. $\sqrt{63}$ 72. $\sqrt{4} \bullet \sqrt{30}$ 73. $\frac{\sqrt{240}}{\sqrt{20}}$

74. An object is dropped from an initial height of s feet. The object's height at any time t , in seconds, is given by $h = -16t^2 + s$. How long does it take for an object dropped from 200 feet to hit the ground? Round your result to two decimal places.

75. State the vertex of: $y = 3x^2 - 12x - 3$
76. Graph the parabola: $y = -x^2 - 4x + 1$
77. You toss a ball that travels on the path $y = -0.1x^2 + x + 2$ where x and y are measured in meters. Sketch the path of the ball. How high does the ball go? (*Use your calculator.*)
78. Graph the following equation, and determine the solutions, if there are any: $y = 3x^2 + 3x - 6$ (*Use your calculator.*)

79. A rocket is launched from atop a 41-foot cliff with an initial velocity of 103 feet per second. The height of the rocket t seconds after launch is given by the equation $h = -16t^2 + 103t + 41$ Graph the equation to find out how long after the rocket is launched it will hit the ground. Round to the nearest tenth of a second.

Remember to leave all answers in simplified radical form.

80. Solve: $x^2 - 12x + 30 = 0$
81. Solve by the quadratic formula:
 $4x^2 - 24x + 33 = 0$

82. Find the discriminant: $2x^2 - 2x + 6 = 0$

Decide how many solutions each equation has:

83. $-x^2 + 3x = 2$ 84. $x^2 - 4x + 4 = 0$

Subtract:

85. $(-6x^3 + 2x) - (7x - 3 - 3x^3)$
86. $(2m^4 - 5m^2 + 2m) - (-3m^4 - 4m^3 - 8m^2 - 2m)$

87. Classify $4r^3$ and state its degree.

88. Add the polynomials $3x^2 - 5x + 7$ and $4x^2 + 8x - 3$

Multiply:

89. $(a^2 + 2)(3a - 1)$ 90. $(x + 4)(x^2 - 2x - 1)$

91. A rectangle has length $x + 9$ and width $x - 9$. Find the equation that describes the area, A , of the rectangle in terms of x .

92. Write $(x^2 - 4)^2$ as a trinomial.

Factor:

93. $x^2 - 10x + 24$ 94. $x^2 - 11x + 24$
95. $7x^2 + x - 8$ 96. $15k^4 + 32k^2 + 9$
97. $4x^2 - 19x - 5$ 98. $18u^4v^3 + 30uv^5v^4$

Solve:

99. $(x - 6)(x + 2) = 0$ 100. $x^2 + 2x - 24 = 0$
101. $3x - 7x^2 = 0$ 102. $4x^2 + 7x - 2 = 0$

Solve:

103. $x^3 + x^2 - 42x = 0$

104. $x^2 + 3x = 0$

105. $\frac{18}{x-2} = \frac{4}{3}$

106. $\frac{x-1}{x+2} = \frac{3}{x}$

107. The weight, W , of a beam varies *directly* with its length, l . A 10 foot beam weighs 530 pounds. Write an equation relating W to l .

108. x and y vary inversely. If $x = \frac{5}{2}$ when $y = 50$, find an equation relating x and y .

Simplify. (Factor first!)

109. $\frac{-3x}{x-x^2}$

110. $\frac{x^2+4x}{x^2-16}$

Give the domain for each expression.

111. $\frac{1}{d+2}$

112. $\sqrt{x+3}$

Perform the indicated operation and simplify:

113. $\frac{9y^2}{4} \bullet \frac{16x}{12y}$

114. $\frac{16x^6}{9x^4} \bullet \frac{15x}{8x^2}$

#115 - 120 are challenge problems!

115. $\frac{2}{x-3} \bullet \frac{2x-6}{8(x+4)}$

116. $\frac{x+6}{x-6} \div \frac{x^2-36}{6-x}$

117. $\frac{x}{x+3} - \frac{8}{7}$

118. $\frac{2x^2-6x+3}{-2x}$

Solve:

119. $\frac{x}{2} - \frac{x}{5} = 3$

120. $\frac{t}{t-1} + \frac{t}{t-9} = 1$

121. Write an equation that can be used to solve the problem. Solve the equation and answer the question. A sight-seeing boat travels at an average speed of 20 miles per hour in the calm water of a large lake. The same boat is also used for sight-seeing in a nearby river. In the river, the boat travels 2.9 miles downstream (with the current) in the same amount of time it takes to travel 2.5 miles upstream (against the current). Find the current of the river.

122. After taking 5 quizzes, your average is 72 out of 100. What must your average score be on the next five quizzes to increase your average to 79? Write an equation and solve.

Perform the indicated operation and simplify:

123. $\sqrt{80} + \sqrt{20}$

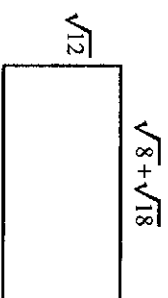
124. $4\sqrt{5} - \sqrt{81} - 7\sqrt{20}$

125. $(\sqrt{2} + \sqrt{3})\sqrt{6}$

126. Simplify: $\sqrt{\frac{27}{8}}$

127. Prove whether or not $3 - 3\sqrt{3}$ is a solution of the equation $2(x-3)^2 - 54 = 0$

128. Find the area and perimeter:



Solve:

129. $\sqrt{x-8} - 3 = 3$

130. $\sqrt{1-2x} = -4$

131. $\sqrt{2-x} = 2-x$

132. Find the term that must be added to the expression to create a perfect square trinomial. $x^2 + 18x$

133. Find the number that must divide each term in the equation so that the equation can be solved by the method of completing the square: $9x^2 - 3x = 13$

134. Solve by completing the square. $t^2 + 6t - 3 = 0$

135. Determine the coordinates of the midpoint of \overline{DA} and find the distance DA for the points $D(-3, -2)$ and $A(2, 7)$.

KEY Review Packet for Honors Geometry

- [1] $-x$
 [2] -27
 [3] $7 + 3x$
 [4] associative property for multiplication
 [5] \$23.24
 [6] 14
 [7] $n = 11$
 [8] $-\frac{7}{6}$
 [9] $\frac{26}{3}$
 [10] $\frac{20}{3}$
 [11] -72

[12] $\frac{5}{6}$

[13] -2

[14] $-\frac{5}{3}$

[15] $\frac{26}{5}$

[16] 34

[17] $e = \frac{d}{c+1}$

[18] $\left(\frac{5}{2}, 3\right)$

[19] $x = 2$; undefined

[20] $y = 7$; zero

[21] $y = -\frac{1}{2}x - \frac{7}{2}$

[22] x-intercept: $\frac{7}{6}$;
y-intercept: 7

[23] undefined

[24] $-\frac{12}{17}$

[25] $y = \frac{5}{2}x - \frac{7}{2}$

[26] $y = -\frac{8}{5}x - \frac{2}{5}$, not parallel

[27] No

[28] It does. Domain: $\{a, b, c, d\}$

[29] $y = -\frac{6}{5}x - 2$

[30] $y = 12x + 70$; \$1138

[44]

[31] $y = \frac{3}{2}x - \frac{13}{2}$

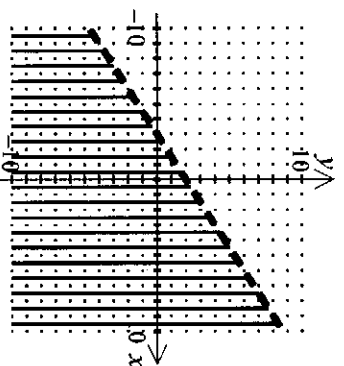
[32] $y + 4 = -10(x - 3)$

[33] $5x + 6y = -8$

[34] $2x - 3y = 12$

[35] $75x + 2y = 1875$

[36] $x > -\frac{7}{2}$



[48] $\left(-\frac{10}{9}, -\frac{16}{9}\right)$

[49] width = 2 cm, length = 9 cm

[50] (3, -3)

[51] No solution

[52] Same line, infinitely many of solutions.

[53] $\left(\frac{1}{2}, -\frac{1}{4}\right)$

[54] $\left(-\frac{1}{18}, \frac{2}{9}\right)$

[55] Same line, infinitely many solutions.

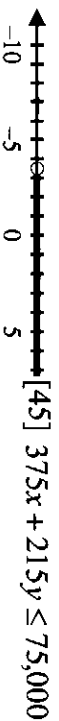
[56] 295 adult, 202 student

[57] 13, 35

[58] $x = 3.75$ lb; $y = 6.25$ lb

[59] $x + y = 80$
 $4.50x + 2.50y = 240$

$x = 20$ pounds of cashews
 $y = 60$ pounds of peanuts



[45] $375x + 215y \leq 75,000$

[46] 12, 14, 16

[47]

[37] $x < -3$

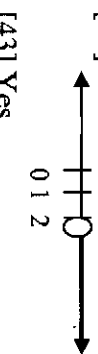
[38] $-\frac{1}{2} \leq x < \frac{3}{2}$

[39] $-9 \leq x \leq -2$

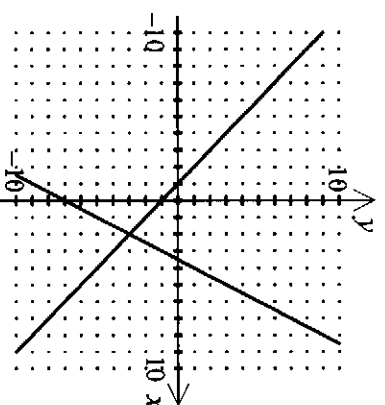
[40] 11, -7

[41] $-11 < x < 3$

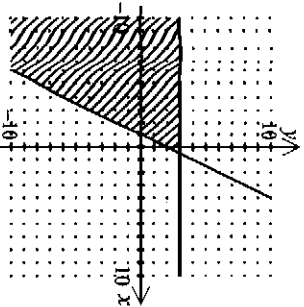
[42] $x > 2$



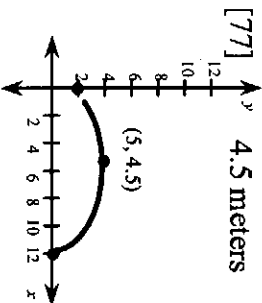
[43] Yes



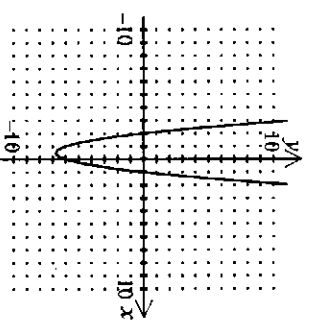
[60] $h+s \leq 37$
 $8h+7s \geq 281$



[61]



[78] $x = -2, 1$



[62] $x^6/-27$

[79] 6.8 seconds

[63] $144x^{10}$

[80] $6 \pm \sqrt{6}$

[64] $\frac{x^2y}{9}$

[81] $3 \pm \frac{\sqrt{3}}{2}$

[65] $\frac{x^2y^2}{3}$

[82] -44

[83] 2

[66] $\frac{5x^3}{y^3}$

[85] $-3x^3 - 5x + 3$

[86] $5m^4 + 4m^3 + 3m^2 + 4m$

[67] $\frac{2x}{y^6}$

[87] monomial, 3

[88] $7x^2 + 3x + 4$

[68] $\frac{-2y^2}{x}$

[89] $3a^3 - a^2 + 6a - 2$

[90] $x^3 + 2x^2 - 9x - 4$

[69] $\frac{x^2}{y^3}$

[91] $A = x^2 - 81$

[92] $x^4 - 8x^2 + 16$

[93] $(x-6)(x-4)$

[70] $-\frac{7}{8}, \frac{7}{8}$

[94] $(x-8)(x-3)$

[95] $(7x+8)(x-1)$

[71] $3\sqrt{7}$

[96] $(5k^2+9)(3k^2+1)$

[97] $(4x+1)(x-5)$

[72] $2\sqrt{30}$

[98] $6u^4v^4(3v+5u)$

[73] $2\sqrt{3}$

[99] 6, -2

[74] 3.54 seconds

[100] -6, 4

[75] (2, -15)

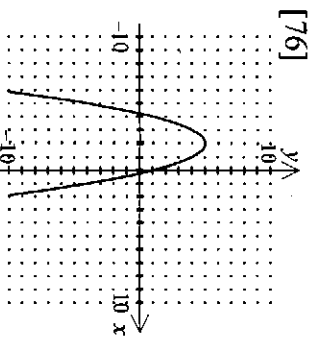
[101] $0, \frac{3}{7}$

[102] $-2, \frac{1}{4}$

[103] -7, 0, 6

[104] 0, -3

[76]



[105] $\frac{31}{2}$

[106] $2 \pm \sqrt{10}$

[107] $W = 53l$

[108] $xy = 125$

$$[109] \frac{3}{x-1}$$

$$[132] 81$$

$$[133] 9$$

$$[110] \frac{x}{x-4}$$

$$[134] -3 \pm 2\sqrt{3}$$

$$[111] \text{ All real numbers except } [135] \text{ midpoint} = \left(-\frac{1}{2}, \frac{5}{2} \right)$$

$$\text{distance} = \sqrt{106}$$

-2.

[112] All real numbers

greater than or equal to -3

$$[113] 3xy$$

$$[114] \frac{10}{3}x \text{ or } \frac{10x}{3}$$

$$[115] \frac{1}{2(x+4)}$$

$$[116] \frac{1}{6-x} \text{ or } -\frac{1}{x-6}$$

$$[117] \frac{-x-24}{7x+21}$$

$$[118] -x + 3 - \frac{3}{2x}$$

$$[119] 10$$

$$[120] 3, -3$$

$$[121] \frac{2.9}{20+c} = \frac{2.5}{20-c}; 1.48$$

mph

$$[122] \frac{360+5x}{10} = 79; \text{ Avg.}$$

Score 86

$$[123] 6\sqrt{5}$$

$$[124]$$

$$-9 - 10\sqrt{5} \text{ or } -10\sqrt{5} - 9$$

$$[125] 2\sqrt{3} + 3\sqrt{2}$$

$$[126] \frac{3}{4}\sqrt{6}$$

[127] It is a solution. It makes the statement true.

$$[128] \text{ Area: } 10\sqrt{6}$$

Perimeter:

$$4\sqrt{3} + 10\sqrt{2}$$

$$[129] 44$$

[130] No solution

$$[131] 1, 2$$

Name: _____

Order of Operations:

Evaluate each expression. Write your answer in simplest form.

1. $4^2 \cdot 2 + [7 - (3^2 - 5)]$

2. $[15(10) - 12(10)] \div 10$

3. $(8 - 4) \cdot (12 - 3) \cdot \frac{1}{2}(2 + 1 \times 2)$

4. $4[(3 + 2 \times 3) - 5] + 7$

5. $8 \div 4 \times 2 - 2 \times 2$

6. $3^2 + 7 \times 2 - 8 \times 2$

Fractions:

Evaluate each expression. Write your answer in simplest form. Where applicable, leave your answers as improper fractions (reduce, reduce, reduce. NO DECIMALS!)

7. $\frac{1}{3} \left(\frac{5}{6} - \frac{3}{4} + \frac{2}{3} \right)$

8. $\frac{\frac{3}{8} - \frac{8}{12}}{\frac{3}{8} \cdot 2}$

9. $-\frac{4}{9} \cdot \frac{3}{2} - \frac{5}{6} + 3$

10. $\left(4 - \frac{5}{6} + 3 \times 2 \right) \div \frac{5}{6}$

11. $\frac{\frac{2}{3} + 4}{\frac{3}{5} - \frac{4}{6}}$

12. $\frac{\frac{3}{2} + \frac{3}{4} + \frac{3}{8}}{21}$

Exponents:

Simplify each expression. Write your answer in simplest form. Where applicable, leave answers as improper fractions. The simplified expressions should have no negative exponents.

13. $\frac{4x^8}{6x^{-5}}$

14. $(6xy^2)(-8x + 9y)$

15. $(3x \cdot x^3)^{-2}$

16. $\frac{x^2y}{3y^3x^3}$

17. $(12xy)^0(x^2y^4)^3$

18. $\frac{2x^{-2}y}{3y^{-3}x^2}$