Name: _____

2023 Honors Algebra II Summer Math Packet
NO CALCULATORS

This is the summer review packet for students entering Honors Algebra II.

Review packets are designed to help you prepare for your next math class.

Instructions:

   You have been enrolled into Google Classroom: 2021 Honors Algebra 2
- Start review packets at least 2 weeks prior to the start of the school year.
- Spend approximately an hour per day working through the packet.
- You will turn in the completed packet on the first day of class.
- An answer key is provided, however, ensure your work is shown to receive full credit.
- You may write your answer directly on this sheet or staple additional work to this packet.
- You are expected to use your notes from Algebra 1 and Geometry & your Algebra I book.

Remember: This packet is for your benefit and is intended to help you succeed as you move through more advanced math classes.

Some Helpful Online Resources:

http://www.purplemath.com/modules/index.htm

https://www.khanacademy.org/math/algebra I

https://www.mathway.com/Algebra http://www.sosmath.com/

https://photomath.net/en/ http://www.livemath.com/

https://sites.google.com/a/epsne.org/mr-smith/how-to-study-math

PreCalculus Videos

For this review, you will need your class notes taken in Algebra 1 to use as a reference. You will also need several formulas:

- the quadratic formula, for solving equations of the form $ax^2 + bx + c = 0$

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

- the slope formula for two points in the plane: (x_1, y_1) and (x_2, y_2)

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

- the standard form for the equation of a line: $Ax + By = C$, where A, B, & C are integers and $A > 0$
- the slope-intercept form of a line: $y = mx + b$
- the fact that parallel lines have the same slopes and perpendicular lines have slopes that are opposite reciprocals ($m_1 * m_2 = -1$) Note: * is used for multiplication.
- The properties: commutative, associative, distributive, etc.
- The distance formula: $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Show as much work as possible for each problem. The answers are at the back of the packet, so you must show work to earn the credit, but please check your answers as you work.

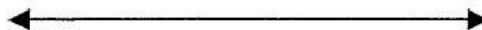1) Insert =, <, > to make a true statement $\dfrac{7}{16}$? $-\dfrac{3}{10}$

2) Give the slope of the line that contains (1, 4) and (4, 4).

3) Evaluate $(5s + 5t)^2$ for s = -4 and t = 2.

4) Find the solution: $\dfrac{6}{w - 3} = \dfrac{5}{w + 3}$

5) Multiply: $(x + 6)(x - 7)$
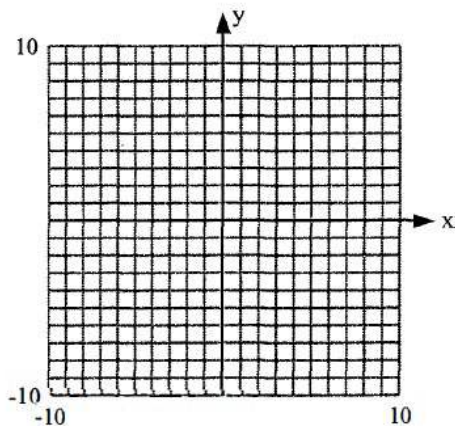
6) Solve and graph on the number line: $3(x + 2) > 5x + 18$

7) Find the value of $2x^2 + x + 3$ when $x = 3$.

8) Arrange in order of decreasing magnitude and write using > :
6.782, $6.78\bar{2}$, $6.\overline{782}$

9) Which property does the following statement illustrate?
$(a + b)c = (b + a)c$

10) Write the standard form of the equation of the line passing through the point $(2,5)$ and perpendicular to the line $4x - y = 2$.
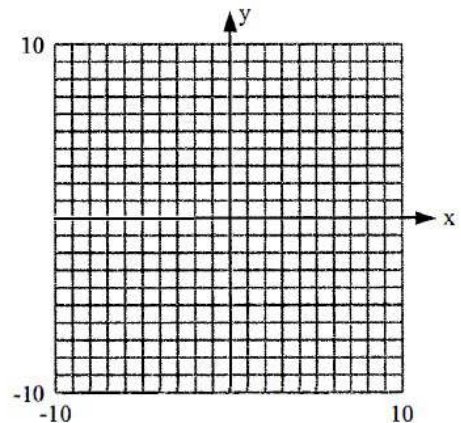
11) Graph: $y = \dfrac{8}{7}x - 4$

12) True or False. The set of natural numbers is. $\{1, 2, 3, 4,...\}$

13) True or False. A rational number can be expressed as the quotient $\dfrac{a}{b}$ where $b \neq 0$

14) Graph: $2x + y = 4$

15) The number: -5, belongs to which of the following sets?
(circle all that apply)
natural numbers, whole numbers, integers, rational numbers, irrational numbers, real numbers

16) Does the number -12 satisfy the equation $2 = 14 - x$? Show your work.

17) If $y = 2x^2 + 5x + 4$, find y when
a) $x = -3$

b) $x = 0$

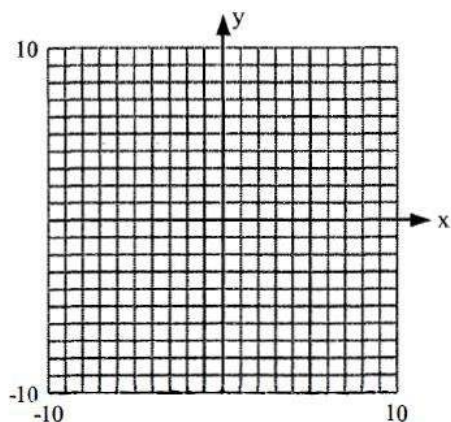18) If $y = \dfrac{4}{7}x + 4$, find y when

    a) x = - 35

    b) x = 7

19) Multiply: $(5x + 2y)^2$

20) Multiply: $(4x + 7)(2x + 1)$

21) Multiply: $(x - 1)(x + 9)$

22) Graph $y = 3x - 9$

23) Solve for a:
$$8a = 6\{4a - [4a + (2a - 5)]\}$$

24) Evaluate the formula:

    $w = \dfrac{x}{yz}$ for x = 3, y = 5, z = 3

25) Simplify:
$(3p^3 - 2) - (3p + 1) + (4p^3 + 5p)$

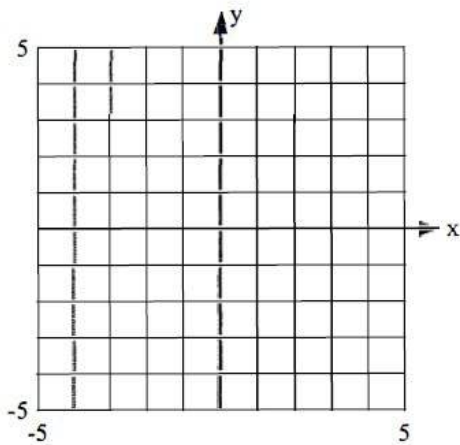26) Find the slope of the line passing through the points (-2, 7) and (-4, 2).

27) Solve for x: $2x + 9 = 27$

28) A line has a slope m = 2. Determine whether the line through (5,4) and (3, 5) is parallel or perpendicular to the first line.

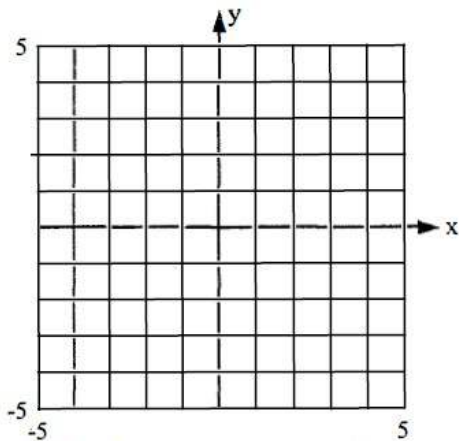29) Solve and graph on the number line: $7(x + 5) > 9x + 37$

30) Graph: $x - y = 1$

31) Simplify: $-2(9 - 4) - 3(-6 - 6)$

32) Graph: $y = \dfrac{1}{4}x - 1$

33) Solve for x: $3(x + 2) = -7$

34) Is $\dfrac{8}{7}$ a solution of the equation:

$7x - 3 = 5$? Show your work.

35) Simplify: $-2.9 - (-6.8) + 6.6$

36) Classify $\sqrt{4}$ as rational or irrational.

37) Multiply: $-6.2 * 4.7$

38) The number $\sqrt{11}$ belongs to which of the following sets? (circle the correct sets of numbers)
Natural numbers, whole numbers, integers, rational numbers, irrational numbers, real numbers
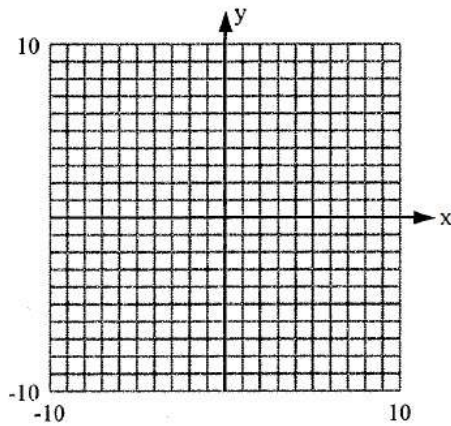
39) Multiply: $(x + 7)(x - 7)$

40) Determine whether the graphs of $y = -3x + 5$ and $2x - 6y = 9$ are parallel or perpendicular lines.

41) Solve for y: $3.5 = 0.7y$

42) The line through A (-4, 5) and B (2, y) is perpendicular to a line with slope 1. Find y.
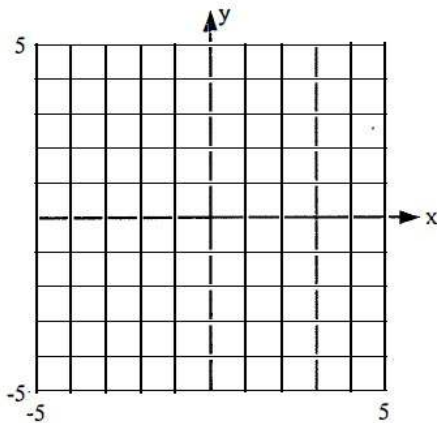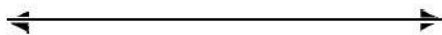
43) Graph: $3x - 8y = -24$

44) Is $\dfrac{7}{3}$ a solution of the equation $3x + 3 = -4$? Show your work.

45) Simplify: $648 \div (6 * 9 \div 3)$

46) Graph: $3x + y = 3$

47) Graph: $|x| \geq 5$

48) Multiply: $\dfrac{7}{8} * \dfrac{4}{3}$

49) Multiply: $(2x + 3)^2$

50) What property is illustrated by the fact that $73 + 0 = 73$?

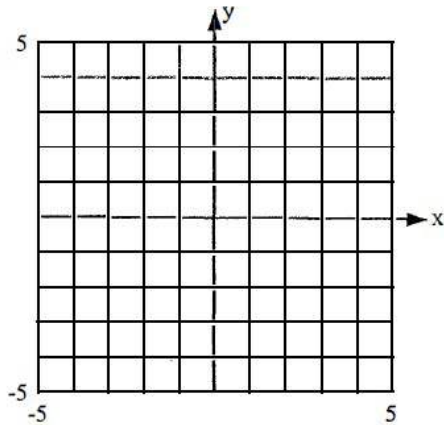51) Does the number 4 satisfy the equation: $11 = 15 - x$? Show your work.

52) Evaluate $2y^2(x + y)$ when $x = 5$, and $y = 2$.

53) Divide: $\dfrac{4}{5} \div \left(-\dfrac{7}{15}\right)$

54) Simplify: $6|8 - 10|$

55) Write the slope-intercept form of the equation of the line passing through the point $(5,0)$ and parallel to the line $y = -4x - 2$.

56) Graph: $y = -\dfrac{2}{3}x - 3$

57) Simplify: $\left(\dfrac{6+(-9)}{-3-9}\right)\left(\dfrac{24+(-72)}{3-6}\right)$

58) Find the pair of parallel lines:
 a. $-y + 3x = 8$
 b. $3x + y = 8$
 c. $-y = 3x + 8$

59) Multiply: $(5x - 2)(3x - 7)$

60) Simplify: $(10 + 3 * 6 \div 3 - 6) \div 5$

61) Which property is illustrated by the following statement?
$(2 * 7) = (7 * 2)$

62) Give the slope of the line that contains (8, 9) and (8, 8).

63) What property is illustrated by the fact that
$(36 + 19) + 28 = 36 + (19 + 28)$

64) Simplify:
$(5w^4 - 1) - (6w^3 + 6) + (6w^4 - 4w^3)$

65) Factor: $w^2 - 8w + 16$

66) Factor: $3x^3 - 6x^2 - 9x$

67) Factor: $16r^2 + 40r + 25$ (Hint: this is a perfect square!)

68) Simplify: $-3\sqrt{81}$

69) Solve using the quadratic formula:
$x^2 + 6x + 4 = 0$

70) Multiply: $(7p^2 - 3p + 4)(8p - 6)$

71) Simplify: $\dfrac{5(x-5)^5(x-2)^6}{20(x-5)^9(x-2)^4}$

72) Solve by factoring:
$x^2 - 13x + 12 = 0$

73) Factor by grouping:
$3x^2 + 12x + x + 4$

74) Solve using the quadratic formula:
$x^2 = 5x - 2$

75) Solve the system by substitution:
$\begin{cases} 3x + 2y = -1 \\ y = 2x - 4 \end{cases}$

76) Factor and simplify: $\dfrac{4d + de}{9d}$

77) Solve the system by substitution:
$\begin{cases} y = 4x - 5 \\ y = 5x \end{cases}$

78) Simplify: $7\sqrt{112}$

79) Solve the system: $\begin{cases} 4x + 3y = -14 \\ 8x - 2y = 12 \end{cases}$

80) Simplify: $2\sqrt{6} + 7\sqrt{6} - 3\sqrt{6}$

81) Factor: $x^2 + 5x + 6$

82) Factor: $x^2 - 64$

83) Simplify: $6\sqrt{2} + 5\sqrt{2} - 5\sqrt{2}$

84) Simplify: $\dfrac{8(x-1)^7(x-7)^8}{40(x-1)^9(x-7)^3}$

85) Is the ordered pair (-3, -3) a solution of the system of equations
$\begin{cases} -3x + 4y = -3 \\ 4x - 5y = 3 \end{cases}$ Show your work.

86) Factor and simplify: $\dfrac{-9x}{x - x^2}$

87) Factor: $5x^3 - 5x^2 - 30x$

88) Solve: $6x + 4 = 22$

89) Determine whether the ordered pair (1, 5) is a solution of the system of equations: $\begin{cases} y = -5x \\ 3x + y = 2 \end{cases}$

90) Solve: $\dfrac{3}{5}x + 1 = 0$

91) Solve by factoring: $x^2 - 7x + 10 = 0$

92) Find the distance between the points (-2, 3) and (4, 10)

93) Solve: $4 + 8x = -20$

94) Multiply: $3x(x^2 - 2x - 4)$

95) Multiply: $4(x^2 + 2x + 3)$

96) Solve: $3(x + 2) = 4$

97) Solve the system by substitution: $\begin{cases} x - 4y = 2 \\ x = -1 + y \end{cases}$

98) Solve the system: $\begin{cases} 3x + 2y = -5 \\ 6x + 4y = 11 \end{cases}$

99) Solve: $x + 4 \geq 6$

100) $7 - x < 5$

Answer Key: Algebra 2 Summer Math Packet

1. $\frac{7}{16} > -\frac{3}{10}$

2. $m = 0$

3. 100

4. $w = -33$

5. $x^2 - x - 42$

6. $x < -6$
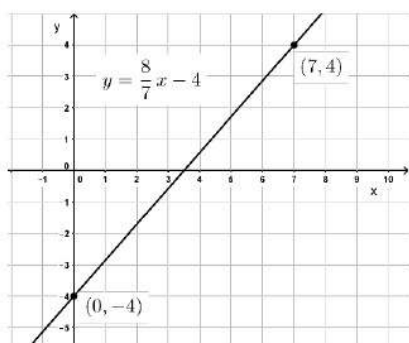

7. $x = 24$

8. $6.7\overline{82} > 6.68\overline{2} > 6.782$

9. Commutative property of addition
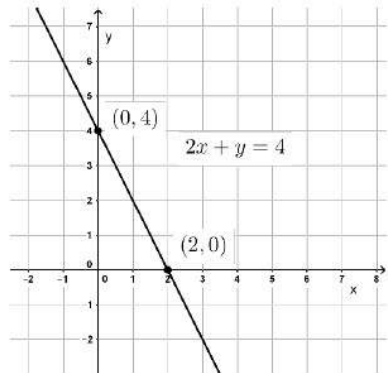
10. $x + 4y = 22$

11.

12. True

13. True

14.

15. Integers, rational numbers, real numbers

16. No, $2 \neq 26$

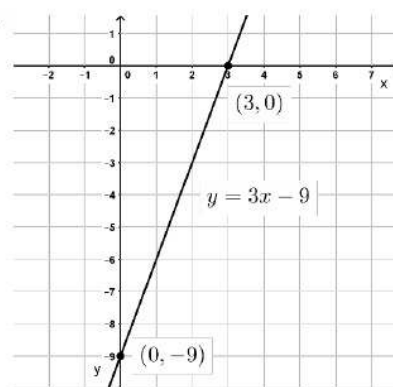17. a) $y = 7$ b) $y = 4$

18. a) $y = -16$ b) $y = 8$

19. $25x^2 + 20xy + 4y^2$

20. $8x^2 + 18x + 7$

21. $x^2 + 8x - 9$

22.

23. $a = \frac{3}{2}$

24. $w = \frac{1}{5}$

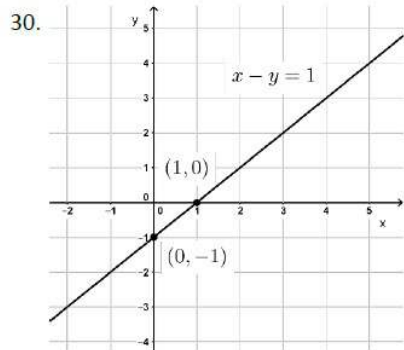25. $7p^3 + 2p - 3$

26. $m = \frac{5}{2}$
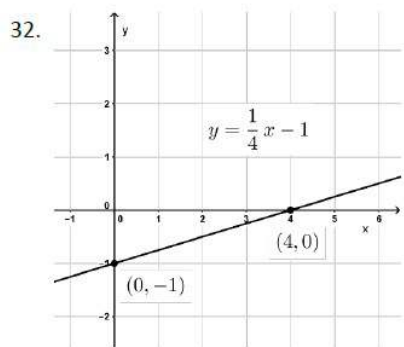
27. $x = 9$

28. Perpendicular

29. $x < -1$

Answer Key: Algebra 2 Summer Math Packet

30.

Graph of $x - y = 1$ with points $(1,0)$ and $(0,-1)$

31. 26

32.

Graph of $y = \frac{1}{4}x - 1$ with points $(4,0)$ and $(0,-1)$

33. $x = -\frac{13}{3}$

34. Yes, $5 = 5$

35. 10.5

36. Rational

37. -29.14

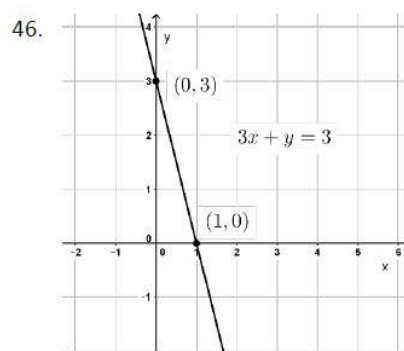38. Irrational numbers, real numbers

39. $x^2 - 49$
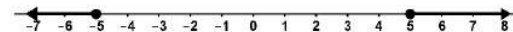
40. Perpendicular

41. $y = 5$

42. $y = -1$

43.

Graph of $3x - 8y = -24$ with points $(0,3)$ and $(-8,0)$

44. No, $10 \neq -4$

45. 36

46.

Graph of $3x + y = 3$ with points $(0,3)$ and $(1,0)$
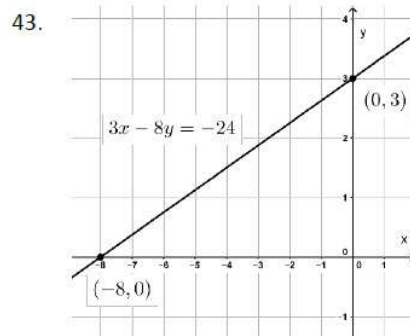
47.

48. $\frac{7}{6}$

49. $4x^2 + 12x + 9$

50. Identity property of addition or addition property of zero

51. Yes, $11 = 11$

52. 56
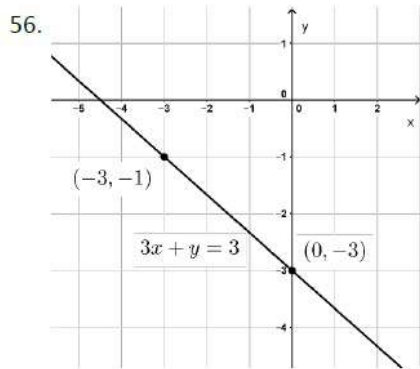
53. $-\frac{12}{7}$

54. 12

55. $y = -4x + 20$

Answer Key: Algebra 2 Summer Math Packet

56.

$3x + y = 3$ $(0, -3)$ $(-3, -1)$

57. 4

58. b & c

59. $15x^2 - 41x + 14$

60. 2

61. Commutative property of multiplication

62. Undefined (or no slope)

63. Associative property of addition

64. $11w^4 - 10w^3 - 7$

65. $(w - 4)^2$

66. $3x(x - 3)(x + 1)$

67. $(4r + 5)^2$

68. -27

69. $x = -3 \pm \sqrt{5}$

70. $56p^3 - 66p^2 + 50p - 24$

71. $\dfrac{(x-2)^2}{4(x-5)^4}$

72. $x = 12, x = 1$

73. $(x + 4)(3x + 1)$

74. $x = \dfrac{5 \pm \sqrt{17}}{2}$

75. $x = 1, y = -2$

76. $\dfrac{4+e}{9}$

77. $x = -5, y = -25$

78. $28\sqrt{7}$

79. $x = \dfrac{1}{4}, y = -5$

80. $6\sqrt{6}$

81. $(x + 3)(x + 2)$

82. $(x + 8)(x - 8)$

83. $6\sqrt{2}$

84. $\dfrac{(x-7)^5}{5(x-1)^2}$

85. Yes

86. $-\dfrac{9}{1-x} = \dfrac{9}{x-1}$

87. $5x(x - 3)(x + 2)$

88. $x = 3$

89. No

90. $x = -\dfrac{5}{3}$

91. $x = 5, x = 2$

92. $\sqrt{85}$

93. $x = -3$

94. $3x^3 - 6x^2 - 12x$

95. $4x^2 + 8x + 12$

96. $x = -\dfrac{2}{3}$

97. $x = -2, y = -1$

98. No solution

99. $x \geq 2$

100. $x > 2$