WJHS Summer Math Packet
For Rising Algebra 2/Honors Algebra 2 Students

This packet is an optional review of the skills that will help you be successful in Algebra 2. By completing this packet over the summer, you will not only keep your brain mathematically active but you will be able to identify skills that you need to strengthen for your year ahead. Complete the exercises then check your answers with the Answer Key. If you struggle with any of the exercises, please seek help from a friend, parent, sibling, book, or online resource (some suggestions have been provided for you). Enjoy your math review and we look forward to meeting you in August!

**For rising Honors Algebra 2 students only.*

I. Operations on Numbers

Rational Numbers http://www.mathsisfun.com/rational-numbers.html

Simplify.

1. $84+(-90)=$ _____

2. $\frac{-12}{30}=$ _____

3. $-\frac{3}{4}+\frac{5}{4}=$ _____

4. $-\frac{2}{3}-\frac{1}{4}=$ _____

5. $-\frac{1}{5}-\left(-\frac{4}{7}\right)=$ _____

6. $\left(\frac{2}{3}\right)\left(-\frac{15}{16}\right)=$ _____

7. $\left(-\frac{1}{2}\right)\left(-\frac{1}{3}\right)\left(-\frac{3}{4}\right)=$ _____

8. $\frac{-6(-6+2)}{-10+(-2)}=$ _____

9. $\left(-\frac{3}{4}\right)\left(\frac{1}{2}\right)=$ _____

10. $-\frac{15}{32}\div\left(-\frac{3}{10}\right)=$ _____

11. $\frac{57y-12}{3}=$ _____

Order of Operations http://www.themathpage.com/alg/algebraic-expressions.htm#order

Simplify each expression using PEMDAS.

12. $\left[(12-14)-10^2+2\right]\div 5^2$ _____

13. $\dfrac{50-(8-9)+\frac{12}{4}}{4^2-7}$ _____

Evaluate.

14. b^2-4ac if $a=3, b=-5, c=-1$ _____

15. $mx+b$ if $m=-\frac{2}{5}, b=-\frac{3}{10}, x=-1$ _____

II. Linear Equations in One Variable http://www.themathpage.com/alg/equations.htm

Solve each linear equation. A solution is a value for the variable that makes the equation true. You should check each solution to verify that it makes the left side of the equation equal to the right side.

16. $8-5w=-37$ _____

17. $\frac{b+1}{3}=2$ _____

18. $\frac{5}{2}c-8=-3$ _____

19. $-\frac{h}{3}-4=13$ _____

20. $2.5g+0.45=0.95$ _____

21. $8+4k=-10+k$ _____

22. $\frac{2}{3}n+8=\frac{1}{2}n+2$ _____

23. $-7(2d-4)=5(6-2d)$ _____

24. $\frac{1}{9}(2m-16)=\frac{1}{3}(2m+4)$ _____

25. $2(a+8)+7=5(a+2)-3a-19$ _____

26. $\frac{3}{7}=\frac{x-2}{6}$ _____

27. Solve for x in terms of b and c.

$2x+b=c$ _____

28. Solve for z in terms of a and b.

$\frac{b-4z}{7}=a$ _____

29. Solve for w in terms of y.

$2w-y=7w-2$ _____

III. Linear Equations in Two Variables http://www.themathpage.com/alg/equations.htm

Slope: Find the slope of the line that passes through the two points. If the slope does not exist, write *no slope.*

30. (14,-8) and (7,-6) _____ 31. (4,-3) and (8,-3) _____ 32. (-2,4) and (-2,9) _____

Slope-Intercept Form

33. Write the equation of the line whose slope is $-\frac{3}{2}$ and whose y-intercept is 5. _____

State the slope and y-intercept then graph each line. Label the y-intercept and a second point on each line.

34. $y = -5x + 2$

35. $y = \frac{2}{5}x - 4$

Graph each horizontal or vertical line. Label two points on each line.

36. $x = -4$ 37. $y = 5$ 38. $x = 1$ 39. $y = 0$

40. Use slope-intercept form to write the equation of the line whose x-intercept is -3 and whose y-intercept is 6.

_____

41. Use slope-intercept form to write the equation of the line that passes through the points (-1,6) and (3,-2).

_____

IV. Systems of Linear Equations

http://www.themathpage.com/alg/simultaneous-equations.htm#addition

Solve each system using the indicated method. If there is no solution or an infinite number of solutions, state so and explain why.

42. $\begin{cases} x+y=1 \\ y=\frac{1}{3}x+5 \end{cases}$

43. $\begin{cases} 2x+2y=7 \\ x-2y=-1 \end{cases}$

44. $\begin{cases} 3x+2y=-1 \\ 4x+2y=-6 \end{cases}$

45. $\begin{cases} 4x+5y=6 \\ 6x-7y=-20 \end{cases}$

V. Exponents http://www.themathpage.com/alg/exponents.htm
http://www.themathpage.com/alg/negative-exponents.htm

Simplify.

46. $(-6)^0$ = _____

47. $c^4 \cdot c^2 \cdot c$ = _____

48. $(-4x^3)(-5x^7)$ = _____

49. $(n^2)^5$ = _____

50. $(7x^6)^2$ = _____

51. $(-5n)^3$ = _____

52. $(4a^3b)^2(b^3)$ = _____

53. $(-18m^2n)^2\left(\frac{1}{6}mn^2\right)$ = _____

54. $\frac{6^5}{6^3}$ = _____

55. $\frac{-2y^7}{14y^5}$ = _____

56. $\frac{-6m}{15m^3}$ = _____

57. $\frac{x^5y^3}{xy^7}$ = _____

58. $\left(\frac{2}{5}\right)^3$ = _____

59. $\left(-\frac{3}{7}\right)^2$ = _____

VI. Simplifying Polynomials

60. $(2m^2+5m-1)+(4m^2-8m-6)$

61. $(n^2+3n+2)-(2n^2-6n-2)$

62. $-4x(2x^3-2x+3)$

63. $2b(b^2+4b+8)-3b(3b^2+9b-18)+5b^2$

C. Find each product using the FOIL or box method.
http://www.themathpage.com/alg/quadratic-trinomial.htm

64. $(x+5)(x+7)$

65. $(x-6)(x-2)$

66. $(x+8)(x-5)$

67. $(x+4)(x-4)$

68. $(x+4)(x+4)$

69. $(c-8)^2$

70. $(3d+1)^2$ 71. $(2x-1)(x+5)$ 72. $(7g+4)(7g-4)$

VII. Factoring Polynomials

http://www.wtamu.edu/academic/anns/mps/math/mathlab/col_algebra/col_alg_tut7_factor.htm

https://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/factoring-quadratic-expressions-core-algebra/v/factoring-quadratic-expressions

https://www.khanacademy.org/math/algebra-basics/quadratics-polynomials-topic/factoring-quadratic-expressions-core-algebra/v/factoring-trinomials-with-a-common-factor

Factor each polynomial using the Distributive Property. In other words, by factoring out the GCF.

73. $24x+16$ _____ 74. $14y^3-28y^2+y$ _____

Trinomials in the Form ax^2+bx+c, where $a=1$. Factor each trinomial into two binomials. If not factorable, write PRIME.

75. $m^2+12m+32$ = _____

76. r^2-3r+2 = _____

77. $x^2-4x-21$ = _____

78. $x^2+8x-16$ = _____

79. $m^2+4m-12$ = _____

80. $d^2+63-16d$ = _____

81. $48-16g+g^2$ = _____

Trinomials in the Form ax^2+bx+c, where $a\neq 1$. Factor each trinomial into two binomials. If not factorable, write PRIME.

82. $2x^2+5x+3$ = _____

83. $3m^2-8m-3$ = _____

84. $4c^2-19c+21$ = _____

85. $2t^2 - 11t + 15$ = _____

86. $4n^2 + 8n - 5$ = _____

87. $2x^2 + 3x - 6$ = _____

Factor each difference of squares. If not factorable, write PRIME.

88. $x^2 - 81$ = _____

89. $4n^2 - 25$ = _____

90. $-49 + c^2$ = _____

91. $d^2 + 4e^2$ = _____

VIII. Quadratic Formula

http://www.regentsprep.org/Regents/math/algtrig/ATE3/quadformula.htm

Solve each equation using the Quadratic Formula. If $ax^2 + bx + c = 0$, then $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

92. $5x^2 + 3x - 1 = 0$

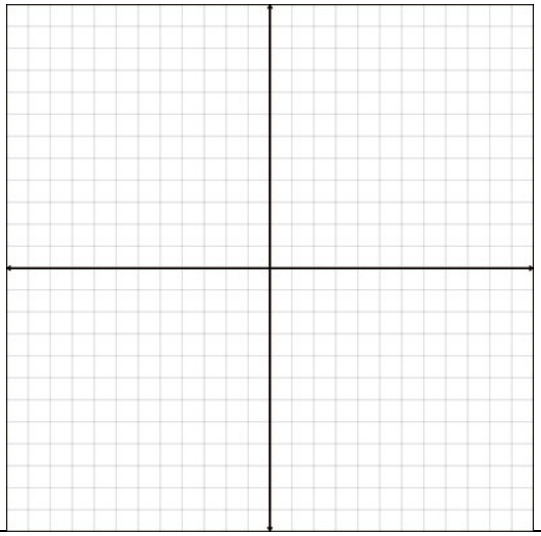
93. $x^2 + 4x = -20$

94. $-7x^2 + 2x = -9$

IX. Graphing: Identify the transformations from the parent function. Then graph the function.
http://www.purplemath.com/modules/fcntrans.htm

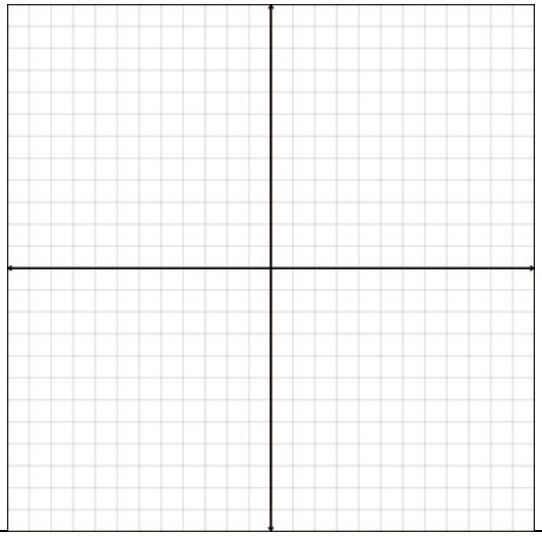
Parent Function: $f(x) = x^2$

Transformed Function: $g(x) = (x - 2)^2$



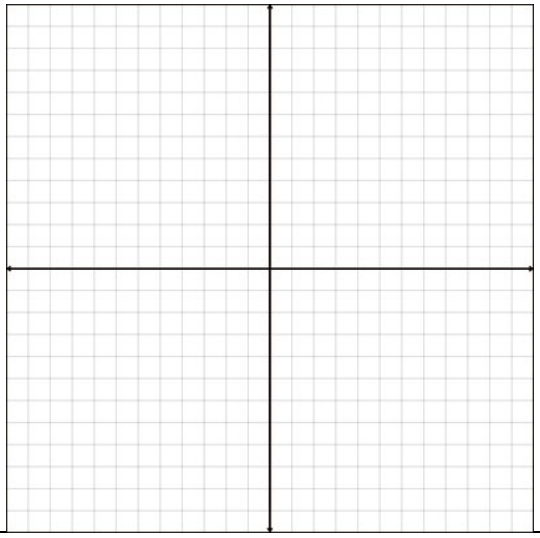
Parent Function: $f(x) = x^2$

Transformed Function: $g(x) = x^2 - 4$



Parent Function: $f(x) = x^3$

Transformed Function: $g(x) = (x+1)^3 - 5$



Parent Function: $f(x) = |x|$

Transformed Function: $g(x) = 2|x|$