This packet is an optional review of the skills that will help you be successful in Algebra 2 in the fall. By completing this packet over the summer, you will keep your brain mathematically active and you will also be able to identify skills that you need to strengthen. Complete the practice problems and 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!

I. Operations on Numbers

A. Absolute Value

Simplify. Evaluate.

1. $|7| = \underline{\hspace{1cm}}$  
2. $|-4| = \underline{\hspace{1cm}}$  
3. $|x| + \frac{1}{2}$ if $x = \frac{1}{2}$ \underline{\hspace{1cm}}
4. $14 - |c|$ if $c = -10$ \underline{\hspace{1cm}}

B. Rational Numbers

Simplify.

5. $84 + (-90) = \underline{\hspace{1cm}}$  
6. $-\frac{12}{30} = \underline{\hspace{1cm}}$  
7. $-\frac{2}{3} - \frac{1}{4} = \underline{\hspace{1cm}}$

8. $-\frac{15}{32} \div \left(-\frac{3}{10}\right) = \underline{\hspace{1cm}}$  
9. $\frac{57y-12}{3} = \underline{\hspace{1cm}}$

C. Radicals

Simplify.

10. $\sqrt{64} = \underline{\hspace{1cm}}$  
11. $-\sqrt{81} = \underline{\hspace{1cm}}$  
12. $-\sqrt{\frac{25}{16}} = \underline{\hspace{1cm}}$
D. Exponents  
http://www.themathpage.com/alg/algebraic-expressions.htm#powers

Simplify.

13. \(7^2 = \) ______  
14. \((-4)^2 = \) ______  
15. \(-5^2 = \) ______  
16. \((-\frac{3}{4})^2 = \) ______

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

Simplify each expression using PEMDAS.

17. \([(12 - 14) - 10^2 + 2] \div 5^2 = \) ______  
18. \(\frac{50 - (8 - 9) + \frac{12}{4}}{4^2 - 7} = \) ______

Evaluate.

19. \(b^2 - 4ac\) if \(a = 3, b = -5, c = -1 = \) ______  
20. \(mx + b\) 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.

21. \(8 - 5w = -37 = \) ______  
22. \(\frac{b + 1}{3} = 2 = \) ______

23. \(\frac{5}{2}c - 8 = -3 = \) ______  
24. \(-\frac{h}{3} - 4 = 13 = \) ______

25. \(8 + 4k = -10 + k = \) ______  
26. \(\frac{2}{3}n + 8 = \frac{1}{2}n + 2 = \) ______

27. \(-7(2d - 4) = 5(6 - 2d) = \) ______  
28. \(\frac{3}{7} = \frac{x - 2}{6} = \) ______

29. Solve for \(x\) in terms of \(b\) and \(c\). \(2x + b = c = \) ______
30. Solve for \( z \) in terms of \( a \) and \( b \).
\[
\frac{b-4z}{7} = a
\]
31. Solve for \( w \) in terms of \( y \).
\[
2w-y = 7w-2
\]

**III. Linear Equations in Two Variables**

http://www.themathpage.com/alg/equations.htm

A. Slope

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

32. \((14,-8)\) and \((7,-6)\) __________
33. \((4,-3)\) and \((8,-3)\) _____ _____
34. \((-2,4)\) and \((-2,9)\) __________

B. Slope-Intercept Form

35. 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.

36. \(y = -5x + 2\)
37. \(y = \frac{2}{5}x - 4\)

**IV. Power Rules**

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

Simplify.

38. \((-6)^0 = \) __________
39. \(c^4 \cdot c^2 \cdot c = \) __________
40. \((-4x^3)(-5x^7) = \) __________
41. \((n^2)^5 = \) __________
42. \((7x^6)^2 = \) __________
43. \(\frac{6^5}{6^3} = \) __________
44. \(\frac{-2y^7}{14y^5} = \) __________
45. \(\frac{x^5y^3}{xy^7} = \) __________
46. \(\left(\frac{2}{5}\right)^3 = \) __________
47. \(5^{-2} = \) __________
48. \((3x)^3 = \) __________
49. \(\frac{g^{-7}}{g^4} = \) __________
V. Simplifying Polynomials

A. Simplify.

50. \((2m^2 + 5m - 1) + (4m^2 - 8m - 6)\)  
51. \((n^2 + 3n + 2) - (2n^2 - 6n - 2)\)

52. \(-4x(2x^3 - 2x + 3)\)

53. \((n^2 + 3n + 2) - (2n^2 - 6n - 2)\)

B. Find each product using the FOIL or box method.

http://www.themathpage.com/alg/quadratic-trinomial.htm

53. \((x + 5)(x + 7)\)  
54. \((x - 6)(x - 2)\)  
55. \((x + 8)(x - 5)\)

56. \((x + 4)(x - 4)\)  
57. \((a - b)^2\)

VI. Factoring Polynomials

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

A. Find the GCF of each set of monomials.

60. 12, 48 _____  
61. 18, 42 _____  
62. 32, 54 _____  

63. \(72r^2s^2, 36rs^3\) _____  
64. \(24fg^5, 56f^3g\) _____

Factor each polynomial by factoring out the GCF.

65. \(24x + 16\) ____________  
66. \(14y^3 - 28y^2 + y\) ____________

Factor out -1 as the GCF so that the squared term is positive.

67. \(-x^2 + 5x - 6\) ________________  
68. \(-3x^2 - 6x + 4\) ________________

B. Trinomials in the Form \(ax^2 + bx + c\), where \(a = 1\).

Factor each trinomial into two binomials. If not factorable, write PRIME.

69. \(m^2 + 12m + 32\) = ________________

70. \(r^2 - 3r + 2\) = ________________

71. \(x^2 - 4x - 21\) = ________________

72. \(x^2 + 8x - 16\) = ________________
C. Trinomials in the Form \( ax^2 + bx + c \), where \( a \neq 1 \).

Factor each trinomial into two binomials. If not factorable, write PRIME.

73. \( 2x^2 + 5x + 3 = \) ______________________________

74. \( 3m^2 - 8m - 3 = \) ______________________________

75. \( 4c^2 - 19c + 21 = \) ______________________________

76. \( 4n^2 + 8n - 5 = \) ______________________________

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

77. \( x^2 - 81 = \) ______________________________

78. \( 4n^2 - 25 = \) ______________________________

VII. Quadratic Formula


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

79. \( 5x^2 + 3x - 1 = 0 \)       80. \( x^2 + 4x = -20 \)