Algebra I Pre-AP Summer Packet   **Name:** _____

This packet is intended to give students an opportunity to recall the main concepts from 8th Grade Math in order to facilitate their transition to Algebra I Pre-AP. In Algebra, one of the most important things you will learn is how to properly and logically show your work. You will begin practicing properly showing work with this homework assignment.

All work must be shown on each of these problems. Even if you are able to mentally compute an answer, show work anyway. This homework assignment must be complete and ready to turn in on the first day of school. There will be a test over this material in the first week of school.

Geometry Formulas – Students will use basic geometry formulas in word problem applications throughout Algebra I Pre-AP.

Write the indicated geometric formula for each of the following:

1. Perimeter$_{Rectangle}$ =   2. Area$_{Triangle}$ =   3. Circumference$_{Circle}$ =

4. Area$_{Circle}$ =   5. Area$_{Rectangle}$ =   6. Area$_{Trapezoid}$ =

The Coordinate Plane – Students must be familiar with the coordinate plane in preparation for our units on linear and quadratic functions.

a. Write an ordered pair to describe the location of each point
b. Identify the quadrant in which the point lies. If the point is not within a quadrant,
   identify the part of the coordinate plane that the point is on.

7. point L   a.   b.

8. point N   a.   b.

9. point Q   a.   b.
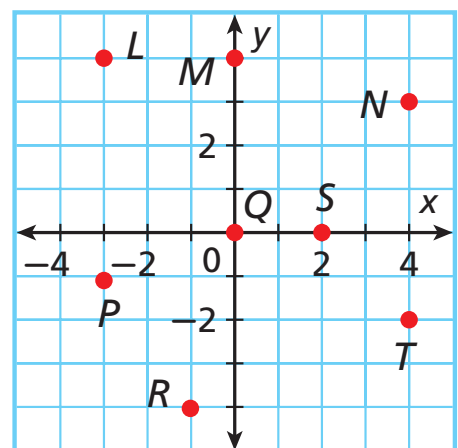
10. point S   a.   b.

11. the point 1 unit down from point T
        a.   b.

12. the point half way between points M and Q
        a.   b.

13. the point 2 units up and 4 units right from point R
        a.   b.

14. the point 3 units down and 4 units left from Point S   a.   b.

Fractions – Students must be fluent in working with fractions since they will be embedded in all of the Algebra that we do.

Write each of the following in simplest form.

15. $\dfrac{25}{30} =$

16. $\dfrac{24}{42} =$

17. $\dfrac{6}{18} =$

18. $\dfrac{3}{19} =$

Add or subtract. Write answer in simplest form. Leave answer as improper fraction.

19. $\dfrac{7}{10} - \dfrac{3}{10}$

20. $\dfrac{7}{15} - \dfrac{1}{6}$

21. $\dfrac{5}{6} + \dfrac{3}{8}$

22. $\dfrac{7}{8} - \dfrac{5}{6}$

Multiply or divide. Write answer in simplest form. Leave answer as improper fraction.

23. $\dfrac{1}{2} \cdot \dfrac{4}{7}$

24. $\dfrac{7}{12} \div \dfrac{1}{12}$

25. $\dfrac{1}{8} \cdot 6$

26. $\dfrac{9}{10} \div \dfrac{5}{8}$

Square Roots & the Real Number System – Students will need to be fluent in the vocabulary of numbers in order to be able to describe domains and ranges in Algebra I Pre-AP.

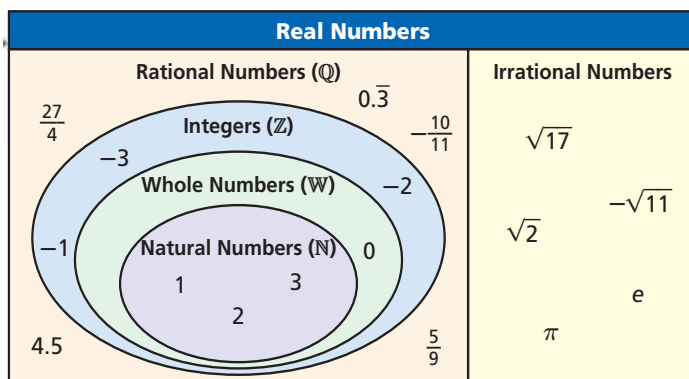Write all classifications that apply to each real number.

27. -1

28. 7

29. $\dfrac{1}{3}$

30. $-\dfrac{32}{95}$

31. $\sqrt{5}$

32. 0

Ordering Real Numbers – Students will need to have a strong understanding of the values of fractions and decimals throughout Algebra I Pre-AP.

Order the numbers in each group from least to greatest.

33. 2.01, 2.1, 2.001

34. -1.01, -1.001, -1.0009

35. $-\frac{3}{8}, -\frac{1}{2}, -\frac{5}{12}$

36. $\frac{7}{11}$, 0.63, 0.636

Operations with Real Numbers and Exponents – Students will need to have a strong understanding of absolute value and exponents in order to be able to graph absolute value and exponential functions.

Simplify.

37. $\left|-45\right|$

38. $\left|-6\right|-\left|-14\right|$

39. $\left(-2\right)^5$

40. $\left|-6-14\right|$

41. $\left(-7\right)^2$

42. 6^{-2}

43. $-\left|-6-14\right|$

44. 0.3^2

45. 9^0

Order of Operations and Evaluating Algebraic Expressions – Students will need to have a strong understanding of the Order of Operations rules in order to be able to evaluate functions for given values.

Simplify.

46. $17-5^2 \div \left(2^4+3^2\right)$

50. $27\left[5^2 \div \left(4^2+3^2\right)+2\right]$

48. $\left(10^2-4\cdot 8\right) \div \left(8+9\right)$

47. $9+\left[4-\left(10-9\right)^2\right]^3$

49. $\dfrac{5+2(-8)}{(-2)^3-3}$

51. $|4-7|^2 \div (-3)$

Translate each of the following into an algebraic expression.

52. the sum of 9 and k minus 17

53. 7 minus the product of v and 3

54. 6 more than 5 times n

55. 9 less than the quotient of 37 and t

Evaluate each expression for the given variables.

56. $b(b-a)$; $a=3$ and $b=7$

57. $10-x+y \div 2$; $x=5$ & $y=2$

58. $15-(m+p)$; $m=-5$ & $p=-10$

59. $p-2+qp$; $p=-7$ & $q=4$

Simplifying Expressions /Properties – Students will need to be fluent in using algebraic properties to simplify expressions during our units on solving equations.
#60-65: Match each property with an expression.

____Commutative Property of Addition	A. 3x + 4 = 4 + 3x
____Distributive Property	B. 3 + 0 = 3
____Identity Property of Addition	C. 3 (0) = 0
____Multiplicative Property of Zero	D. 3(x + 4) = 3x + 12
____Associative Property of Addition	E. 3 + (7 +9) = (3 + 7) + 9
____Identity Property of Multiplication	F. 3 (1) = 3

Simplify by combining like terms.

66. $b-3+6-2b$

68. $-33v-49v-(-2v)$

70. $10x + 36 - 38x - 47$

69. $3 - 8(7 - 5n)$

67. $-2(7 - n) + 4$

71. $5x^2 - 2(x - 3x^2)$

Solving Equations – Students will need to have a strong understanding of absolute value and exponents in order to be able to graph absolute value and exponential functions.

Solve and check each equation.

72. $c - 4 = 9$

76. $3b + 7 = -2$

73. $-8n = -64$

77. $2n - 5 = 7$

74. $b + 5 = -13$

78. $4 - x = -20$

75. $-4 = \dfrac{2}{5}a$

79. $9 = -x + 8$

Inequalities – Students will need to be fluent in working with simple inequalities in order to be able to solve compound inequalities.

Answer yes or no.

80. Is each number a solution of $x \le 7$?

    a. 9

    b. -1

    c. 7

81. Is each number a solution of $x > -4.1$?

    a. 8

    b. -5

    c. -4.1

82. Is each number a solution of $6x - 3 \ge 15$?

    a. 0

    b. -2

    c. 3

83. Is each number a solution of $2t + 1 < -3$
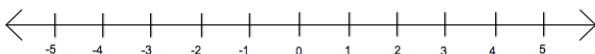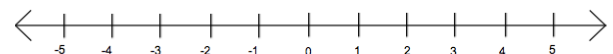
    a. -3

    b. -2

    c. -1

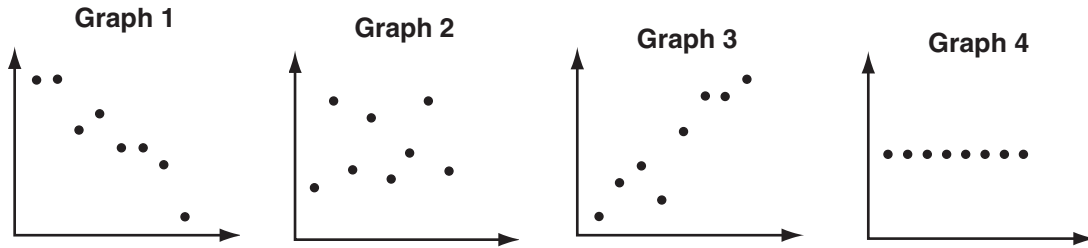Graph each inequality on the number line provided.

84. $x \ge -\dfrac{3}{2}$

85. $x < 3$

Scatter Plots – Students need to have a basic understanding of how to relate points in the coordinate plane to real-world situations. We will build on this skill in Algebra I Pre-AP.

Choose the scatter plot that best represents the described relationship.

Graph 1

Graph 2

Graph 3

Graph 4

86. the distance a person runs and how physically tired that person is

87. a person's age and the amount of broccoli the person eats

88. the price of a new car and the number of hours in a day

89. the number of cats in a barn and the number of mice in that barn

#90-92: Dawn is trying to improve her reading skills by taking a speed-reading class. She is measuring how many words per minute (wpm) she can read after each week of the class.

Graph a scatter plot using the given data.

Weeks	1	2	3	4	5
wpm	220	230	260	260	280

90. Describe the correlation illustrated by the scatter plot.

91. Draw a trend line and use it to predict the number of words per minute that Dawn will read after 8 weeks of this class.

92. Dawn is paying for this class each week out of her savings account. Identify the correlation between the number of classes and Dawn's account balance.

Reading Speed

Words per Minute

400
380
360
340
320
300
280
260
240
220
200

1   2   3   4   5   6   7   8   9   10
Weeks