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 an assessment 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. $\text{Perimeter}_{\text{Rectangle}}$ =

2. $\text{Area}_{\text{Triangle}}$ =

3. $\text{Circumference}_{\text{Circle}}$ =

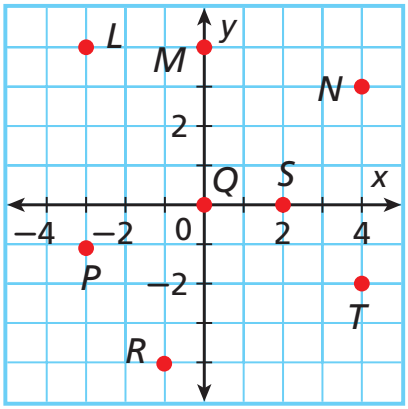
4. $\text{Area}_{\text{Circle}}$ =

5. $\text{Area}_{\text{Rectangle}}$ =

6. $\text{Area}_{\text{Trapezoid}}$ =

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

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

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

10. 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. No Calculators should be used. All work must be shown.

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

11. $\frac{7}{10}-\frac{3}{10}$

12. $\frac{7}{15}-\frac{1}{6}$

13. $\frac{5}{6}+\frac{3}{8}$

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

14. $\frac{1}{2}\bullet\frac{4}{7}$

15. $\frac{7}{12}\div\frac{1}{12}$

16. $\frac{9}{10}\div\frac{5}{8}$

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.

17. -1

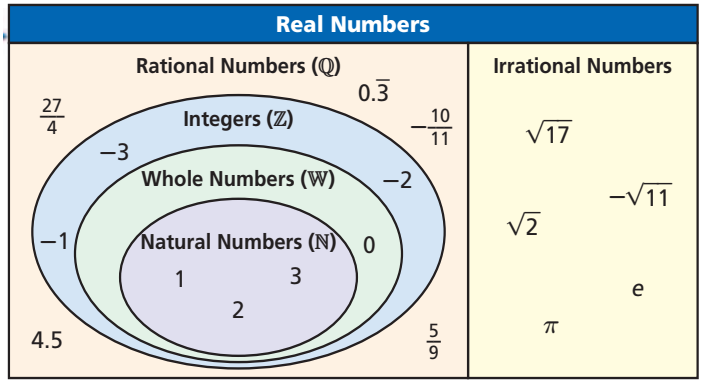
18. 0. 7

19. $\frac{1}{3}$

20. $-\frac{32}{95}$

21. $\sqrt{5}$

22. 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. Show all work necessary to support your answer.

23. 2.01, 2.1, 2.001

24. -1.01, -1.001, -1.0009

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

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. No calculators should be used. All work must be shown.

Simplify.

26. $|-6-14|$

27. $-|-6-14|$

28. $|-6|-|-14|$

29. $(-7)^2$

30. $(-2)^5$

31. 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. No calculators should be used. All work must be shown.

Simplify.

32. $9+\left[4-(10-9)^2\right]^3$

33. $\frac{5+2(-8)}{(-2)^3-3}$

34. $|4-7|^2 \div (-3)$

Translate each of the following into an algebraic expression.

35. the sum of 9 and *k* minus 17

36. 7 minus the product of *v* and 3

37. 6 more than 5 times *n*

38. 9 less than the quotient of 37 and *t*

Evaluate each expression for the given variables. Show ALL WORK.

39. $15 - (m + p)$; $m = -5$ & $p = -10$

40. $10 - x + y \div 2$; $x = 5$ & $y = 2$

Simplifying Expressions /Properties – Students will need to be fluent in using algebraic properties to simplify expressions during our units on solving equations.

41. 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.

42. $3 - 8(7 - 5n)$

43. $10x + 36 - 38x - 47$

44. $5x^2 - 2(x - 3x^2)$

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 for each a, b and c of each problem.

45. Is each number a solution of $x \leq 7$?

a. 9

b. -1

c. 7

46. Is each number a solution of $6x - 3 \geq 15$?

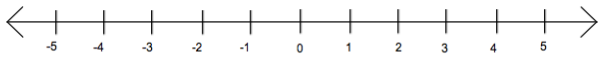
a. 0

b. -2

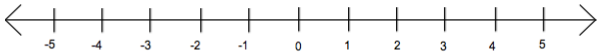
c. 3

Graph each inequality on the number line provided.

47. $x \geq -\frac{3}{2}$

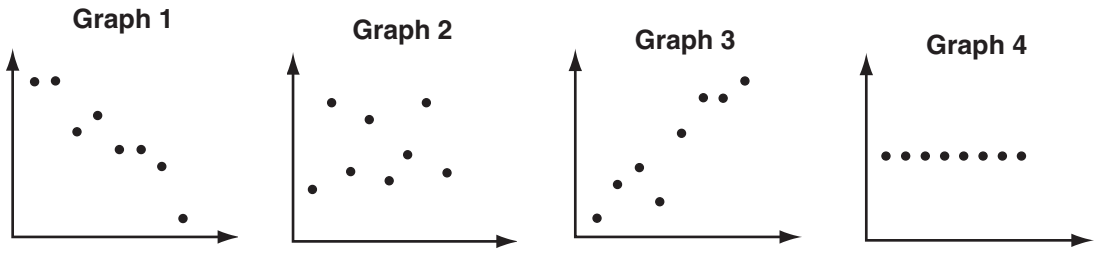


48. $x < 3$



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.



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

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

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

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

#53-55: 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.

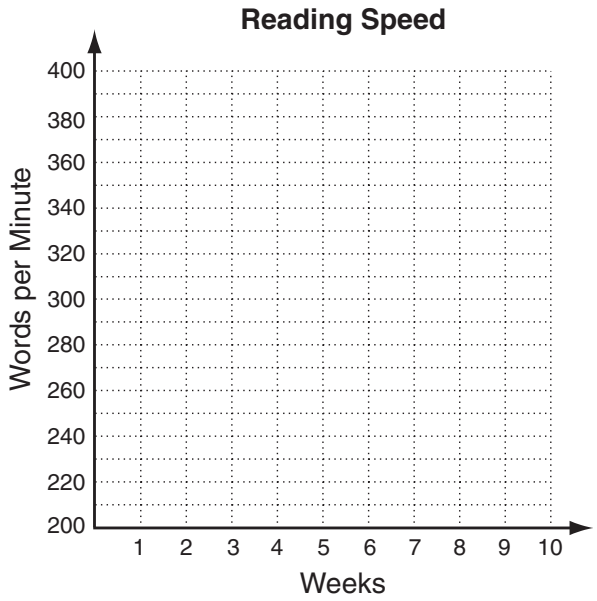
Graph a scatter plot using the given data.

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

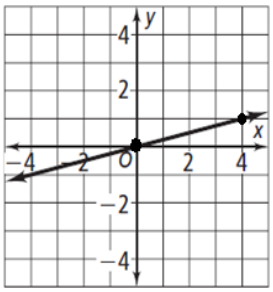
53. Describe the correlation illustrated by the scatter plot.

54. 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.

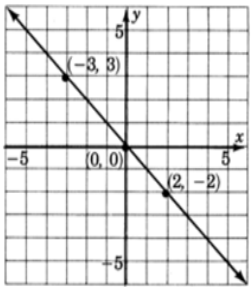
55. Dawn is paying for this class each week out of her savings account. Identify the correlation between the number of classes and Dawn's account balance.



56. Is the function represented by the graph proportional or non-proportional? Find the slope and y-intercept. Write the equation of the function in slope-intercept form.

a. 

Circle one Proportional / Non-proportional
Slope _____
y-intercept ____
Equation _____

b. 

Circle one Proportional / Non-proportional
Slope _____
y-intercept ____
Equation _____

57. Is the function represented by the table proportional or non-proportional? Find the slope and y-intercept. Write the equation of the function in slope-intercept form.

a.

Time , x	10	20	30	40
Jumping Jacks Completed, y	15	30	45	60

Circle one Proportional / Non-proportional
Slope _____
y-intercept ____
Equation _____

b.

x	1	2	3	4
y	5	7	9	11

Circle one Proportional / Non-proportional
Slope _____
y-intercept ____
Equation _____

c.

Hours Rented (h)	**Cost ($)**
2	50
4	100
6	150
8	200

Circle one Proportional / Non-proportional
Slope_____
y-intercept____
Equation _____

d. $y = \frac{2}{3}x + 2$

Circle one Proportional / Non-proportional
Slope_____
y-intercept____

58. Write the function to represent the situation.

a. Louise is collecting can tabs for charity. She already has 35 collected and intends to collect 4 each week.

Function _____ Circle one Proportional / Non-proportional

What do the slope and y-intercept represent?_____

b. Student tickets for the school play cost $6.50 each.

Function _____ Circle one Proportional / Non-proportional

What do the slope and y-intercept represent?_____

59. Write an equation in slope-intercept form with the given slope and *y*-intercept.

a. slope = 3, *y*-intercept = –1 Equation _____

b. slope = $\frac{5}{2}$, *y*-intercept = 6 Equation _____

60. Determine the slope of the line that passes through each pair of points.

a. (-2, 6) and (9,-5) Slope = _____

b. (0, 2) and (4, -1) Slope = _____

61. Determine the domain and range of the relation

a. {(-2, 4), (1, 3), (0, -4), (3, 2)}.

Domain:
Range:

b.

x	-3	-1	2	3
y	2	3	5	2

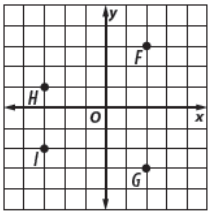
Domain:
Range:

62. Determine whether the relation is a function. Explain.

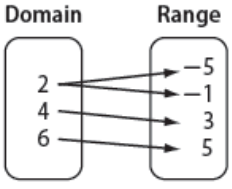
a.

x	-5	-2	-2
y	3	7	-5

b.



c.



d. {(-4, 8), (-1, 10), (1, 10), (5, 12)}

63. Solve the equation. Show *all* appropriate work; do not just write the solution.

a. $-2(5x - 1) = 2x - 6$

b. $3x + 2 - 4x = 7x - 2$

64. For each of the following, define a variable for the unknown, write and solve an equation, then answer the question that was asked. ONLY ONE VARIABLE SHOULD BE USED FOR EACH.

a. Three times a number decreased by four is equal to twenty-five.

b. In captivity, the average life span of an elephant is 25 years more than that of an elk. The sum of the two ages is 55 years. What is the average life span of an elk in captivity?

c. Six is subtracted from a number. Then the result is divided by 4. The new result is added to 10 to give a final result of 30. What is the number?

d. One angle of a triangle measures 10 degrees more than the second. The measure of the third angle is twice the sum of the first two angles. Find the measure of the angle in the triangle that has the greatest degree.

e. The length of a rectangle is 10 more than three times its width. The perimeter of the rectangle is 108. Find the dimensions of the rectangle.