Dear PreAP Algebra I Student,

Congratulations! In signing up for Pre Advanced Placement Algebra I, you have signed up for a fast paced and rigorous course. PreAp classes are designed to prepare you for more challenging AP courses. "AP" stands for **Advanced Placement**. In the math department, students can take AP Calculus AB, AP Calculus BC and AP Statistics during their junior/senior year. These courses are college equivalent and students can gain college credit if they score high enough on the College Board AP exam. In order for you to be prepared for AP classes, the PreAP Algebra I course must have the same rigor. This class will be more in depth than the regular Algebra I course and we will be moving at a faster pace. **There will be very little time to complete homework in class, so you will need to do your work outside of school.**

The material covered in this packet is from previous math courses and are skills in which you should be proficient. Please do your work **neatly in the space provided and without a calculator**. There are notes and examples for each section included in this packet

The packet will be due the first day of class and you will be quizzed over these skills within the first week of school.

If you are having trouble completing this packet, you should carefully consider whether you should be in an advanced algebra I class.

You may email me at soquinn@hisd.com with any questions you may have.

Mrs. O'Quinn

PreAP Algebra I Teacher

Hallsville High School

Least Common Multiple: To determine the least common multiple (LCM) you use math facts to find the smallest number that is a multiple of both given numbers.

Example: 6, 9 The least common multiple of 6 and 9 is **18** because 6 divides evenly into 18, and 9 divides evenly into 18.

Find the LCM of each.

1. 10 ,5

2. 40, 10

3. $\frac{1}{5}$, $\frac{1}{10}$

4. 16, 12

5. 6, 4

Greatest Common Factor: The largest number that divides evenly into all numbers listed.

Example: 18, 24

The greatest common factor of 18 and 24 is **6**, because 6 divides into 18 evenly, and 6 divides into 24 evenly.

Find the GCF of each.

6. 39, 6

7. 40, 10

8. 35, 21

9. 54, 45

10. 68, 34

Order of Operations

Evaluate Algebraic Expressions Algebraic expressions may contain more than one operation. Algebraic expressions can be evaluated if the values of the variables are known. First, replace the variables with their values. Then use the order of operations to calculate the value of the resulting numerical expression.

Example: Evaluate $x^3 + 5(y - 3)$ if $x = 2$ and $y = 12$.

$x^3 + 5(y - 3) = 2^3 + 5(12 - 3)$	Replace x with 2 and y with 12.
$= 8 + 5(12 - 3)$	Evaluate 2^3.
$= 8 + 5(9)$	Subtract 3 from 12.
$= 8 + 45$	Multiply 5 and 9.
$= 53$	Add 8 and 45.

The solution is 53.

Exercises

Evaluate each expression if $x = 2$, $y = 3$, $z = 4$, $a = \frac{4}{5}$, and $b = \frac{3}{5}$.

11. $3x - 5$

12. $x + y^2$

13. $x^3 + y + z^2$

14. $23 - (a + b)$

15. $x(2y + 3z)$

16. $(10x)^2 + 100a$

17. $\frac{z^2 - y^2}{x^2}$

18. $6xz + 5xy$

19. $\frac{5a^2b}{y}$

20. $\left(\frac{x}{z}\right)^2 + \left(\frac{y}{z}\right)^2$

21. $\frac{x + z}{y + 2z}$

22. $\left(\frac{z \div x}{y}\right) + \left(\frac{y \div x}{z}\right)$

Variables, Expressions and Equations

Write Verbal Expressions An **algebraic expression** consists of one or more numbers and variables along with one or more arithmetic operations. In algebra, **variables** are symbols used to represent unspecified numbers or values. Any letter may be used as a variable.

Example: Write a verbal expression for each algebraic expression.

a. $6n^2$
the product of 6 and *n* squared

b. $n^3 - 12m$
the difference of *n* cubed and twelve times *m*

Write a verbal expression for each algebraic expression.

23. $\frac{1}{4}b^2$

24. $4(n^2 + 1)$

Write Algebraic Expressions Translating verbal expressions into algebraic expressions is an important algebraic skill.

Example: Write an algebraic expression for each verbal expression.

a. four more than a number *n*

The words *more than* imply addition.

$n + 4$

b. the difference of a number squared and 8

The expression *difference of* implies subtraction.

$x^2 - 8$

Write an algebraic expression for each verbal expression.

25. 7 more than the product of 6 and a number

26. twice the sum of 15 and a number

27. 30 increased by 3 times the square of a number

28. one-half the square of *b*

Write Equations Writing equations is one strategy for solving problems. You can use a variable to represent an unspecified number or measure referred to in a problem. Then you can write a verbal expression as an algebraic expression.

Example: Translate each sentence into an equation or a formula.

Ten times a number *x* is equal to 2.8 times the difference *y* minus *z*.

$10x = 2.8(y - z)$.

Translate each sentence into an equation or formula.

29. Three times a number *t* minus twelve equals forty.

30. One–half of the difference of *a* and *b* is 54.

31. The area *A* of a circle is the product of π and the radius *r* squared.

Solving Equations with the Variable on Each Side

Variables on Each Side To solve an equation with the same variable on each side, first use the Addition or the Subtraction Property of Equality to write an equivalent equation that has the variable on just one side of the equation. Then solve the equation.

Example 1: Solve $5y - 8 = 3y + 12$.

$$5y - 8 = 3y + 12$$
$$5y - 8 = 3y + 12$$
$$-3y \quad -3y$$
$$2y - 8 = 12$$
$$+8 \quad +8$$
$$2y = 20$$
$$\frac{2y}{2} = \frac{20}{2}$$
$$y = 10$$

The solution is 10.

Example 2: Solve $-7 - \frac{1}{4}y = \frac{1}{2}y + 1$.

$$-7 - \frac{1}{4}y = \frac{1}{2}y + 1$$
$$4\left(-7 - \frac{1}{4}y = \frac{1}{2}y + 1\right)$$
$$-28 - y = 2y + 4$$
$$+y \quad +y$$
$$-28 = 3y + 4$$
$$-4 \quad -4$$
$$-32 = 3y$$
$$\frac{-32}{3} = \frac{3y}{3}$$
$$\frac{-32}{3} = y$$

The solution is $\frac{-32}{3}$.

Exercises

Solve each equation. Check your solution.

32. $6 - b = 5b + 30$

33. $4n - 8 = 3n + 2$

34. $1.2x + 4.3 = 2.1 - x$

35. $4.4m + 6.2 = 8.8m - 1.8$

36. $\frac{1}{2}b + 4 = \frac{1}{8}b + 88$

37. $\frac{3}{4}k - 5 = \frac{1}{4}k - 1$

38. $0.2x - 8 = -2 - x$

39. $3y - 1.8 = 3y - 1.8$

40. $-4 - 3x = 7x - 6$

41. $20 - a = 10a - 2$

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

43. $-4r + 5 = 5 - 4r$

Rate of Change and Slope

Find Slope The **slope** of a line is the ratio of change in the *y*-coordinates (rise) to the change in the *x*-coordinates (run) as you move in the positive direction.

Slope of a Line	$m = \frac{rise}{run}$ or $m = \frac{y_2 - y_1}{x_2 - x_1}$, where (x_1, y_1) and (x_2, y_2) are the coordinates of any two points on a nonvertical line

Example 1: Find the slope of the line that passes through (–3, 5) and (4, –2).

Let (–3, 5) = (x_1, y_1) and (4, –2) = (x_2, y_2).

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

$= \frac{-2 - 5}{4 - (-3)}$ $y_2 = -2$, $y_1 = 5$, $x_2 = 4$, $x_1 = -3$

$= \frac{-7}{7}$ Simplify.

$= -1$

Exercises

Find the slope of the line that passes through each pair of points.

44. (4, 9), (1, 6)

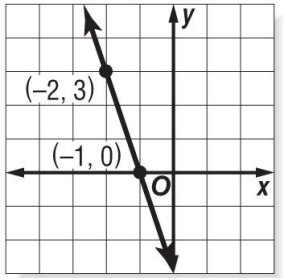
45. $\left(\frac{7}{3}, \frac{4}{3}\right), \left(-\frac{1}{3}, \frac{2}{3}\right)$

46. (14, –8), (7, –6)

47. $(-4, 3.5), (-4, -3.5)$

Use $\frac{\Delta x}{\Delta y}$ or $\frac{rise}{run}$ to count the slope of the line that passes through each pair of points.

48.



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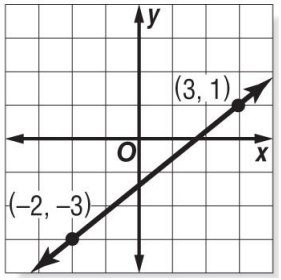

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