Algebra I Advanced   Name:_____

Summer Assignment   Date:_____

                                                          Hour:_____

Directions: **Show all work for full credit. Circle your final answer.**
                    This assignment is due the first day of school.
                    Use the summer assignment glossary to look up any words in which you need clarification.

Summer Assignment Glossary

Difference   The answer to a subtraction problem

Equation   A statement in which two expressions are equivalent

Expression   A collection of number, operations, variables, and grouping symbols

Order of Operations   A procedure of evaluating an expression involving more than one operation.
                            "Please Excuse My Dear Aunt Sally"
                                    P – Parenthesis
                                    E – Exponents
                                    M – Multiplication
                                    D – Division
                                    A – Addition
                                    S – Subtraction

Product   The answer to a multiplication problem

Quotient   The answer to a division problem

Sum   The answer to an addition problem

Variable   A symbol, usually a letter, that is used to represent one or more numbers in an algebraic expression

WHOLE NUMBER OPERATIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):

$*12 + (-7) = 12 - 7 = 5$

$* (-3) \times (-4) = 12$

A negative number times a negative number is a positive number

$* 2 \times (-3) = -6$

$* 25 - 64 = 25 + (-64) = -39$

$* 19 - (-3) = 19 + 3 = 21$

Subtracting a negative is the same as adding a positive

Perform the indicated operation.

1. $12 \times (-7)$

2. $5 + (-9)$

3. $(-36) \div 2$

4. $51 - 64$

5. $5 - (-8)$

6. $(-3) \times (-10)$

7. 13×11

8. $(-98) + 73$

9. $654 + 81$

10. $63 \div 9$

ADDING/SUBTRACTING FRACTIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):   **To add or subtract fractions you must have a common denominator**

$\frac{1}{8} + \frac{5}{8} = \frac{6}{8}$

common denominator

$\frac{2}{5} - \frac{1}{10}$

need to be the same #

Since 5 is a factor of 10, make 10 the common denominator

Multiply $\frac{2}{5}$ by $\frac{2}{2}$.

numerator must match denominator

$\frac{2}{5}\left(\frac{2}{2}\right) = \frac{4}{10}$

Replace $\frac{2}{5}$ with $\frac{4}{10}$

$\frac{4}{10} - \frac{1}{10} = \frac{3}{10}$

$\frac{1}{3}\left(\frac{7}{7}\right) = \frac{7}{21}$

$\frac{3}{7} + \frac{1}{3} = \frac{9}{21} + \frac{7}{21} = \frac{16}{21}$

$\frac{3}{7}\left(\frac{3}{3}\right) = \frac{9}{21}$

Add or subtract.

11. $\frac{2}{3} + \frac{5}{3}$

12. $\frac{1}{4} + \frac{3}{8}$

13. $\frac{5}{7} - \frac{3}{7}$

14. $\frac{9}{14} - \frac{3}{7}$

15. $\frac{5}{9} + \frac{1}{2}$

16. $\frac{3}{5} - \frac{12}{15}$

MULTIPLYING/DIVIDING FRACTIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):

$$* \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$$

$$* \frac{5}{7} \times 2 = \frac{5}{7} \times \frac{2}{1} = \frac{10}{7}$$

$$* \frac{1}{3} \div \frac{1}{2} = \frac{1}{3} \times \frac{2}{1} = \frac{2}{3}$$

$$* \frac{5}{9} \div 4 = \frac{5}{9} \times \frac{1}{4} = \frac{5}{36}$$

Multiply or divide.

17. $\frac{2}{5} \times \frac{2}{3}$

18. $\frac{3}{4} \times 5$

19. $\frac{1}{6} \div \frac{2}{3}$

20. $\frac{3}{5} \div 3$

21. $\frac{3}{8} \times \frac{4}{6}$

22. $\frac{7}{10} \div 7$

EVALUATE EXPRESSIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):

Evaluate $2x+3$ when $x=14$

$$2(14)+3$$
$$= 28+3$$
$$= 31$$

Evaluate the expression.

23. $15x$ when $x = 4$

24. $\frac{24}{f}$ when $f = 8$

25. $y - \frac{1}{2}$ when $y = \frac{5}{6}$

26. x^2 when $x = \frac{3}{4}$

27. $w - 8$ when $w = 20$

28. $h + \frac{1}{3}$ when $h = 1\frac{1}{3}$

ORDER OF OPERATIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):

Simplify.

$\frac{1}{6}(6+18) - 2^2$

$= \frac{1}{6}(24) - 2^2$

$= \frac{1}{6}(24) - 4$

$= 4 - 4$

$= 0$

P- Parenthesis
E- Exponents
M- Multiplication ⎤ Same time,
D- Division ⎦ left to right
A- Addition ⎤ Same time
S-Subtraction ⎦ left to right

Simplify.

29. $3(6+7)$

30. $2 + 7 * 5$

31. $6 \div (2 * 1^3) - 2$

32. $15 \div 3 + 21 \div 7$

33. $2(2 * 4) - 3^2$

34. $7 + 5 * 2 - 6 \div 3$

WRITE EXPRESSIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

KEY CONCEPT *For Your Notebook*

Translating Verbal Phrases

Operation	Verbal Phrase	Expression
Addition: sum, plus, total, more than, increased by	The sum of 2 and a number x	$2 + x$
	A number n plus 7	$n + 7$
Subtraction: difference, less than, minus, decreased by	The difference of a number n and 6	$n - 6$
	A number y minus 5	$y - 5$
Multiplication: times, product, multiplied by, of	12 times a number y	$12y$
	$\frac{1}{3}$ of a number x	$\frac{1}{3}x$
Division: quotient, divided by, divided into	The quotient of a number k and 2	$\frac{k}{2}$

Example(s):

$*$ The quotient of twice a number t and 12 $(\div)$ $(2x)$

$$2t \div 12 = \frac{2t}{12}$$

$*$either answer is acceptable

$*$ Number of days left in the week if d days have passed so far

$$7 - d$$

$*$ Number of months in y years

$$12y$$

Write an expression.

35. 8 more than a number x

36. The product of 6 and a number y

37. The sum of 15 and a number x

38. The difference of 7 and a number n

39. 5 more than 3 times a number w

40. 7 less than twice a number k

41. 50 divided by a number h

42. Number of tokens needed for v video games if each game takes 4 tokens

43. Each person's share if p people share 16 slices of pizza equally

44. Amount you spend if you buy a shirt for $20 and jeans for j dollars

UNIT RATES

Show all work for full credit.

Example(s):

Find the unit rate in feet per second

$$\frac{120\ miles}{2\ hours}$$

How many minutes are in 1 hour?

How many seconds are in 1 min?

How many feet are in 1 mile?

$$\frac{120\ miles}{2\ hours} \times \frac{1\ hour}{60\ min} \times \frac{1\ min}{60\ sec} \times \frac{5280\ ft}{1\ mile} = \frac{88\ ft}{1\ sec}$$

conversions

Find the unit rate in feet per second.

45. $\dfrac{300\ yards}{1\ minute}$

46. $\dfrac{180\ miles}{2\ hours}$

WRITE EQUATIONS AND INEQUALITIES

Show all work for full credit. A calculator is not permitted for this section of problems.

KEY CONCEPT   *For Your Notebook*

Symbol	Meaning	Associated Words
=	is equal to	the same as
<	is less than	fewer than
≤	is less than or equal to	at most, no more than
>	is greater than	more than
≥	is greater than or equal to	at least, no less than

Example(s):

$*$ The difference of twice a number k and 8 is 12

$$2k - 8 = 12$$

$*$ The product of 6 and a number n is at least 24

$$6n \geq 24$$

$*$ A number y is no less than 5 and no more than 13

$$y \geq 5 \qquad y \leq 13$$

$$5 \leq y \leq 13$$

Write an equation or an inequality.

47. The sum of 42 and a number n is equal to 51.

48. The difference of 9 and the quotient of a number t and 6 is 5.

49. The sum of 12 and the quantity 8 times a number k is equal to 48.

50. The product of 4 and a number w is at most 51.

51. The sum of a number b and 3 is greater than 8 and less than 12.

52. The difference of a number t and 7 is greater than 10 and less than 20.

SOLUTIONS OF EQUATIONS

Show all work for full credit. A calculator is not permitted for this section of problems.

Example(s):

Check whether the given number is a solution

$*2n+3 \geq 21 ; 9$

$2(9)+3 \geq 21$

$18+3 \geq 21$

$21 \geq 21$ ✓

Solution

$* \dfrac{b}{12} - 2 = 7 ; 48$

$\dfrac{(48)}{12} - 2 = 7$

$4 - 2 = 7$ Not a

$2 = 7$ ✗   solution

Check whether the given number is a solution of the equation or inequality.

53. $9 + 4y = 17; 1$

54. $15 - 4y > 6; 2$

55. $\dfrac{r}{3} - 4 = 4; 12$

56. $4z - 5 < 3; 2$

57. $\dfrac{x-5}{3} \geq 2.8; 11$

58. $\dfrac{m}{5} + 9 = 11; 10$