

# Pre-Algebra Summer Packet

For students going into Pre-Algebra

## Summer Assignment Glossary

Difference – The answer to a subtraction problem.

Distributive Property – The product of a number and the sum of two numbers is equal to the sum of the two products. For example,  $a(b + c) = ab + ac$

Equation – A statement in which two expressions are equivalent.

Expression – A collection of numbers, operations, variables, and grouping symbols.

Like Fraction – Fractions that have the same denominator.

Like Terms – Two or more terms in an expression that have the same variable and the same powers.

Order of Operations – A procedure for 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.

Simplify an expression – To rewrite the algebraic expression so that there are no like terms.

Substitute – To replace a variable in an expression with a number.

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.

## ADDING AND SUBTRACTING DECIMALS

Objective: To add and subtract decimals.

Example:

Add.

$$\begin{array}{r} 33.200 \\ 9.505 \\ + 4.000 \\ \hline 46.705 \end{array}$$

Subtract.

$$\begin{array}{r} 16.12 \\ - 15.70 \\ \hline 0.42 \end{array}$$

Rewrite the problems vertically (up and down).

Remember to line up the decimal points.

Remember if the number is a whole number the decimal always starts to the right of the number, example 4 so the decimal is 4.0

Show all work for full credit. A calculator is not permitted for these selected problems.

1.  $0.013 + 1.3 + 22$

2.  $4.76 + 95.305 + 52.5$

3.  $6.01 + 0.4401 + 41.7593$

4.  $1.0001 + 2.032 + 0.9$

5.  $6.03 - 0.962$

6.  $7.13 - 1.875$

7.  $87 - 0.003$

8.  $962.3 - 15.677$

9.  $3.45 + 23.607 + 5$

10.  $21 - 0.1$



## ROUNDING DECIMALS

Objective: To round decimals to different place values.

Example:

Round to the hundredth place.  $47.\underline{9}26 \longrightarrow 47.93$

Find the place value to which you wish to round, and underline it. Look at the digit to the right. If the digit to the right is 5 or greater, add 1 to the number underlined. If the digit is less than 5, leave the underlined number unchanged.

Show all work for full credit. A calculator is not permitted for these selected problems.

Round to the nearest tenth.

1. 10.235

2. 8.56

Round to the nearest hundredth.

3. 1.2345

4. 26.5098

Round to the nearest thousandth.

5. 76.00983

6. 5.1477

Round to the nearest dollar.

7. \$34.56

8. \$127.49

## DIVIDING DECIMALS

Objective: To divide decimals.

Example:

Divide.

$$\begin{array}{r} 0.056 \\ 2170 \overline{)122.830} \\ \underline{108.50} \\ 14.330 \\ \underline{13.020} \\ 1.310 \end{array}$$

Remember, you need a whole number divisor. When rounding decimal quotients, divide to one place more than the one to which you are rounding, then round the quotient.

Show all work for full credit. A calculator is not permitted for these selected problems.

Divide.

1.  $5 \div 2.5$

2.  $2.2 \div 0.04$

Divide. Round the answer to the tenth.

3.  $1.87 \div 0.35$

4.  $43 \div 8.2$

Divide. Round the answer to the hundredth.

5.  $1.732 \div 1.03$

6.  $0.075 \div 0.13$

## ADDING FRACTIONS AND MIXED NUMBERS

Objective: To add fractions and mixed numbers.

Example 1:

$$\frac{14}{15} + \frac{2}{5} = \frac{14}{15} + \frac{2 \cdot 3}{5 \cdot 3} = \frac{14}{15} + \frac{6}{15} = \frac{20}{15} = 1 \frac{5}{15} = 1 \frac{1}{3}$$

Example 2:

$$3 \frac{1}{2} + 5 \frac{1}{3} = 3 \frac{1}{2} \cdot \frac{3}{3} + 5 \frac{1}{3} \cdot \frac{2}{2} = 3 \frac{3}{6} + 5 \frac{2}{6} = 8 \frac{5}{6}$$

Remember when adding fractions you need to find a common denominator.

Show all work for full credit. A calculator is not permitted for these selected problems.

Add the fractions. Simplify if possible.

1.  $\frac{3}{5} + \frac{1}{4} =$

2.  $\frac{6}{7} + \frac{3}{4} =$

3.  $\frac{5}{6} + \frac{2}{3} =$

4.  $7 \frac{1}{2} + 8 \frac{1}{3} =$

5.  $2 \frac{3}{8} + 11 \frac{2}{9} =$

6.  $5 \frac{4}{5} + 3 \frac{1}{7} =$

## SUBTRACTING FRACTIONS AND MIXED NUMBERS

Objective: To subtract fractions and mixed numbers.

Example 1:

$$\frac{14}{15} - \frac{2}{5} = \frac{14}{15} - \frac{2 \cdot 3}{5 \cdot 3} = \frac{14}{15} - \frac{6}{15} = \frac{8}{15}$$

Example 2:

$$10\frac{1}{3} - 5\frac{1}{2} = 10\frac{1}{3} \cdot \frac{2}{2} - 5\frac{1}{2} \cdot \frac{3}{3} = 10\frac{2}{6} - 5\frac{3}{6} = 9\frac{8}{6} - 5\frac{3}{6} = 4\frac{5}{6}$$

Remember when subtracting fractions you need to find a common denominator.

Show all work for full credit. A calculator is not permitted for these selected problems.

Subtract the fractions. Simplify if possible.

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

2.  $\frac{6}{7} - \frac{3}{4} =$

3.  $\frac{5}{6} - \frac{2}{3} =$

4.  $7 - \frac{1}{3} =$

5.  $12\frac{1}{8} - 6\frac{2}{9} =$

6.  $5\frac{4}{5} - 3\frac{1}{7} =$



## MULTIPLY FRACTIONS

Objective: To multiply fractions.

Example:

$$3\frac{1}{2} \cdot 1\frac{2}{5} = \frac{7}{2} \cdot \frac{7}{5} = \frac{49}{10} = 4\frac{9}{10}$$

Remember, rewrite the mixed numbers as improper fractions when multiplying. For example with  $3\frac{1}{2}$  you will multiply the 2 and 3 to get 6 then add the numerator 1 to get 7. You will then keep the denominator the same to get  $\frac{7}{2}$ .

Show all work for full credit. A calculator is not permitted for these selected problems.

Multiply the fractions. Simplify if possible.

1.  $\frac{3}{4} \cdot \frac{1}{6} =$

2.  $2\frac{1}{6} \cdot 1\frac{1}{2} =$

3.  $\frac{5}{7} \cdot \frac{3}{10} =$

4.  $5 \cdot 3\frac{3}{10} =$

5.  $3\frac{1}{3} \cdot 4\frac{1}{5} =$

6.  $2\frac{2}{9} \cdot \frac{3}{4} =$

7.  $4 \cdot \frac{2}{3} =$

8.  $6 \cdot 2\frac{3}{8} =$

9.  $1\frac{5}{6} \cdot 2\frac{2}{7} =$

10.  $\frac{4}{9} \cdot \frac{6}{15} \cdot 1\frac{1}{8} =$

## DIVIDING FRACTIONS

Objective: To divide fractions.

Example:

$$2\frac{1}{4} \div 1\frac{3}{4} = \frac{9}{4} \div \frac{7}{4} = \frac{9}{4} \cdot \frac{4}{7} = \frac{9}{7} = 1\frac{2}{7}$$

Remember, rewrite the mixed numbers as improper fractions first. You will then need to “KEEP, SWITCH, FLIP” (keep the first fraction, change the operation to multiplication, and take the reciprocal of the second fraction) then multiply.

Show all work for full credit. A calculator is not permitted for these selected problems.

Divide the fractions. Simplify if possible.

1.  $\frac{2}{3} \div \frac{6}{7} =$

2.  $\frac{4}{5} \div \frac{1}{2} =$

3.  $2\frac{1}{5} \div 1\frac{1}{10} =$

4.  $2\frac{1}{3} \div \frac{7}{8} =$

5.  $5 \div 3\frac{1}{3} =$

6.  $6\frac{1}{3} \div 1\frac{1}{3} =$

7.  $9\frac{1}{2} \div \frac{2}{3} =$

8.  $2\frac{7}{8} \div 7 =$

9.  $7\frac{6}{12} \div 5\frac{4}{5} =$

10.  $12\frac{4}{5} \div 3\frac{1}{2} =$

## ORDER OF OPERATIONS

Objective: To simplify using the order of operations.

Example:

$$\begin{aligned} &2^2 + (3 + 7) \cdot 5 \\ &2^2 + (10) \cdot 5 \\ &4 + (10) \cdot 5 \\ &4 + 50 \\ &54 \end{aligned}$$

Order of Operations

1. Parenthesis
2. Exponents
3. Multiply
4. Add

Show all work for full credit. A calculator is not permitted for these selected problems.

Simplify.

1.  $3^2 + 5 - 10$

2.  $(6 + 9) \div 5 - 2$

3.  $10 \div 2 \cdot 6 \div 3$

4.  $2(7 - 5) + 3 \cdot 4$

5.  $17 - 12 + 5$

6.  $18 - 3^2 \div 9$

7.  $18 - 2 \div 2$

8.  $(18 - 2) \div 2$

9.  $5^2 - 3^2 + 4^2$

10.  $(4^2 - 6) \cdot 8 - 5$

## EVALUATE VARIABLE EXPRESSIONS

Objective: To evaluate variable expressions.

Example:

$$\begin{aligned} \text{Evaluate } a(b + c) \text{ if } a = 5, b = 3, c = 2 \\ 5(3 + 2) \\ 5(5) \\ 25 \end{aligned}$$

Remember to substitute the values in for the variables and then follow the order of operations to simplify.

Show all work for full credit. A calculator is not permitted for these selected problems.

Evaluate each expression if  $x = 7$ ,  $y = 10$ ,  $r = 15$ ,  $p = 3$ , and  $w = 8$ .

1.  $x + y - r$

2.  $w + w + y + y$

3.  $(r + p) + w$

4.  $x + p + w - r + y$

5.  $y + 15 - w + 12 - x$

6.  $85 - 17 + p - x + w$

Evaluate each expression if  $x = 3$ ,  $y = 4$ , and  $z = 5$ .

7.  $6x - 3y$

8.  $6(x + y)$

9.  $(y - x) \div (z - y)$

10.  $2x + 3z + y$

## SOLVING ONE STEP EQUATIONS WITH ADDITION AND SUBTRACTION

Objective: To solve one step equations using addition and subtraction.

Example:

Solve for x.

$$\begin{array}{r} x + 7 = 10 \\ -7 \quad -7 \\ \hline x = 3 \end{array}$$

Show all work for full credit. A calculator is not permitted for these selected problems.

Solve the equation.

1.  $x + 12 = 37$

2.  $x + 3 = 21$

3.  $25 = x + 17$

4.  $x - 7 = 21$

5.  $13 = m - 13$

6.  $w + 18 = 18$

7.  $x + 7 = 7.9$

8.  $x - 5 = 2.5$

9.  $7.8 = m - 2$

## SOLVING ONE STEP EQUATIONS WITH MULTIPLICATION AND DIVISION

Objective: To solve one step equations using multiplication and division.

Example 1:

Solve for n.

$$\begin{array}{r} \underline{4n = 28} \\ 4 \quad 4 \\ n = 7 \end{array}$$

Example 2:

Solve for x.

$$\begin{array}{r} (3)\frac{x}{3} = 9(3) \\ x = 27 \end{array}$$

Show all work for full credit. A calculator is not permitted for these selected problems.

Solve the equation.

1.  $5x = 60$

2.  $\frac{x}{4} = 2$

3.  $\frac{x}{6} = 12$

4.  $9x = 81$

5.  $48 = 12x$

6.  $45 = 5x$

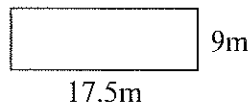
7.  $\frac{x}{3} = 11$

8.  $4x = 48$

## PERIMETER AND AREA

Objective: To calculate the perimeter and area of a polygon.

Example 1:  
Find the perimeter.



$$P = 17.5 + 17.5 + 9 + 9$$

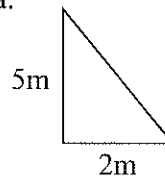
$$P = 53 \text{ m}$$

Formulas:

$$\text{Square } A = s^2$$

$$\text{Rectangle } A = lw$$

Example 2:  
Find the area.



$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(2)(5)$$

$$A = 5m^2$$

Show all work for full credit. A calculator is not permitted for these selected problems.

Find the perimeter.

1. A rectangle with length 8.4cm and width 6 cm.
2. A square with sides  $\frac{5}{6}$  ft.
3. A regular hexagon with sides 12m.

Find the area.

4. A rectangle with length 8.4 cm and width 6 cm.
5. A square with sides  $\frac{5}{6}$  ft.
6. A triangle with base 24 in. and height 7 in.

## ADDING INTEGERS

Objective: To add integers.

Example 1:

When adding two integers with the same sign, you add the numbers and keep the common sign.

$$(-5) + (-3) = -8$$

$$9 + 7 = 16$$

Example 2:

When adding two integers with different signs, subtract the numbers and write the sign of the integer that is further from zero (has the larger absolute value).

$$10 + (-3) = 7$$

$$-8 + 4 = -4$$

Show all work for full credit. A calculator is not permitted for these selected problems.

1.  $(-7) + 1 =$

2.  $(-15) + (-8) =$

3.  $18 + (-6) =$

4.  $(-30) + 5 =$

5.  $(-84) + (-92) =$

6.  $107 + (-112) =$

7.  $24 + (-7) + 22 =$

8.  $(-34) + 9 + (-6) =$

9.  $(-8) + (-3) + (-8) =$



## SUBTRACTING INTEGERS

Objective: To subtract integers.

Example 1:

$$-3 - (-17) = -3 + (+17) = 14$$

Example 2:

$$5 - 18 = 5 + (-18) = -13$$

Show all work for full credit. A calculator is not permitted for these selected problems.

1.  $(-9) - 5 =$

2.  $13 - (-5) =$

3.  $(-17) - (-17) =$

4.  $(-15) - (-20) =$

5.  $(-5) - (-25) =$

6.  $24 - 30 =$

7.  $(-3) - (-5) - 8 =$

8.  $13 - 7 - (-4) =$

9.  $(-5) - 9 - 12 =$

## MULTIPLICATION AND DIVISION OF INTEGERS

Objective: To multiply and divide integers.

Example 1:

$$(-7) \cdot (-9) = 63$$

Example 2:

$$(64) \div (-4) = -16$$

Remember the products and quotients are positive if the two integers have the same sign. The products and quotients are negative if the two integers have different signs.

Show all work for full credit. A calculator is not permitted for these selected problems.

Multiply.

1.  $6 \cdot (-4) =$

2.  $(-9) \cdot 8 =$

3.  $(-6) \cdot (-10) =$

4.  $12 \cdot (-12) =$

5.  $7 \cdot 13 =$

6.  $(-15) \cdot (-6) =$

Divide.

7.  $(-65) \div (-5) =$

8.  $100 \div (-20) =$

9.  $60 \div (-4) =$

10.  $102 \div 3 =$

11.  $(-50) \div (-25) =$

12.  $60 \div (-4) =$