

# 7<sup>th</sup> Grade Math Summer Packet

## FRACTION / DECIMAL EQUIVALENTS

COMMIT TO MEMORY:

$$\frac{1}{4} = 0.25$$

$$\frac{1}{3} = 0.\overline{3}$$

$$\frac{1}{2} = 0.5$$

$$\frac{2}{3} = 0.\overline{6}$$

$$\frac{3}{4} = 0.75$$

$$\frac{1}{8} = 0.125$$

$$\frac{3}{8} = 0.375$$

$$\frac{5}{8} = 0.625$$

$$\frac{7}{8} = 0.875$$

## DIVISIBILITY RULES

A number is divisible by:

- 2 if the ones digit is divisible by 2.
- 3 if the sum of the digits is divisible by 3.
- 5 if the ones digit is 0 or 5.
- 6 if the number is divisible by both 2 and 3.
- 9 if the sum of the digits is divisible by 9.
- 10 if the ones digit is 0.

\* You will rarely be able to use a calculator so have your multiplication tables memorized along with multiplying/dividing large numbers.



# No Calculators

## Level 6 (Course 1) Summer Math Packet

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Write an algebraic expression to represent unknown quantities.

- A variable is a symbol, usually a letter, used to represent a number.
- Algebraic expressions are combinations of variables, numbers, and at least one operation.

Examples:

The sum of 5 and some number is written as:  $5 + n$  because the operation that is associated with the word **sum** is addition.

The difference of a number and three tenths is written as:  $n - .3$  because the operation that is associated with the word **difference** is subtraction.

1.)

a number plus  $\frac{1}{2}$

2.)

a number minus .7

3.)

the difference of twenty-one hundredths and a number

4.)

the sum of a number and forty-six

5.)

Robert has sixty-five more football cards than his friend, John.



6.)

Janell is five-eighths of an inch shorter than Shakiya.

Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

Objective: Evaluate an algebraic expression.

- A **variable** is a symbol, usually a letter, used to represent a number.
- **Algebraic expressions** are combinations of variables, numbers, and at least one operation.
- **Multiplication** in algebra can be shown as  $4n$  or  $4 \times n$
- The variables in an algebraic expression can be replaced with any number.
- Once the variables have been replaced, you can **evaluate**, or find the value of, the algebraic expression.

Examples:

Evaluate  $44 + n$  if  $n = 9$

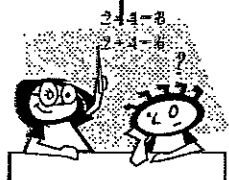
$44 + n$	original expression
$44 + 9$	replace the variable with it's value
53	solution

1.)  
Evaluate  $150 + n$  if  $n = 15$

2.)  
Evaluate  $12n$  if  $n = 9$

3.)  
Evaluate  $15n + 19$  if  $n = \frac{1}{3}$

4.)  
Evaluate  $30n$  if  $n = 2.5$



5.)  
Evaluate  $24n \div k$  if  $n = 6$  and  $k = 8$

6.)  
Evaluate  $nk - 2b + 8$  if  $b = 1.5$ ,  $k = 8$ , and  $n = 7$

# Level 6 (Course 1) Summer Math Packet

**Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS**

**Objective:** Evaluate numeric expressions using order of operations.

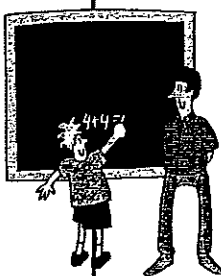
- A **numerical expression** is a combination of numbers and operations.
- The **Order of Operations** tells you which operation to perform first so that everyone gets the same final answer.
- The **Order of Operations** is: **Parentheses, Exponents, Multiplication or Division (left to right), and Addition or Subtraction (left to right).**

PEMDAS

**Examples:**

$48 \div (3 + 3) - 2^2$	original expression
$48 \div 6 - 2^2$	simplify the expression inside the parentheses
$48 \div 6 - 4$	calculate $2^2$
$8 - 4$	divide 48 by 6
$4$	subtract 4 from 8

<p>1.)</p> <p style="text-align: center;"><math>(8 + 1) \times 12 - 13</math></p>	<p>2.)</p> <p style="text-align: center;"><math>13 \times 4 - 72 \div 8</math></p>
<p>3.)</p> <p style="text-align: center;"><math>88 - 16 \times 5 + 2 - 3</math></p>	<p>4.)</p> <p style="text-align: center;"><math>100 \div 5^2 \times 4^3</math></p>
<p>5.)</p> <p style="text-align: center;"><math>45 \div 9 - 3 + 2 \times 3</math></p>	<p>6.)</p> <p style="text-align: center;"><math>(5^2 + 3^3) \times (81 + 9) \div 10</math></p>



Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS

3-4

Objective: Determine the unknown in a linear equation (addition & subtraction).

- **Addition equations:** Subtract the same number from each side of the equation so that the two sides remain equal.
- **Subtraction equations:** Add the same number to each side of the equation so that the two sides remain equal.

Opposite of PEMDAS → SADMEP

Examples:

$$\begin{array}{r} b + 3 = 6 \quad \text{original equation} \\ -3 \quad -3 \quad \text{subtract 3 from each side} \\ \hline b + 0 = 3 \quad \text{solution} \\ b = 3 \quad \text{simplify} \end{array}$$

$$\begin{array}{r} b - 8 = 4 \quad \text{original equation} \\ +8 \quad +8 \quad \text{add 4 to each side} \\ \hline b + 0 = 12 \quad \text{solution} \\ b = 12 \quad \text{simplify} \end{array}$$

1.)

$$g + 5 = 12$$

2.)

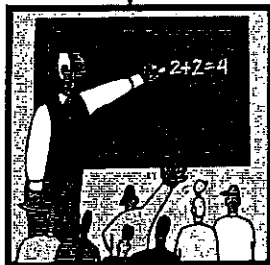
$$s - 12 = 29$$

3.)

$$m + 3.5 = 10.5$$

4.)

$$k - 5.5 = 8.5$$



5.)

$$w + 6.25 = 22$$

6.)

$$g - 3.75 = 49.75$$

## Level 6 (Course 1) Summer Math Packet

**Unit: KNOWLEDGE of ALGEBRA, PATTERNS, and FUNCTIONS**

**Objective:** Determine the unknown in a linear equation (multiplication & division).

\* Same as previous  
SADMEP

- In a **multiplication equation**, the number by which a variable is multiplied is called the **coefficient**. In the multiplication equation  $2x = 8$ , the coefficient is 2.
- **Multiplication equations:** Divide both sides by the coefficient so that the two sides remain equal.
- In a **division equation**, the number by which the variable is divided is called the **divisor**. In the division equation  $\frac{x}{4} = 4$ , 4 is the divisor.
- **Division equations:** Multiply both sides of the equation by the divisor so that the two sides remain equal.

**Examples:**

$$4b = 16 \quad \text{original equation}$$

$$\frac{4b}{4} = \frac{16}{4} \quad \text{divide both sides by 4}$$

$$1b = 4 \quad \text{solution}$$

$$b = 4 \quad \text{simplify}$$

$$\frac{m}{6} = 11 \quad \text{original equation}$$

$$6 \times \frac{m}{6} = 11 \times 6 \quad \text{multiply each side by 6}$$

$$1m = 66 \quad \text{solution}$$

$$m = 66 \quad \text{simplify}$$

1.)

$$7x = 63$$

2.)

$$\frac{k}{9} = 8$$

3.)

$$5b = 3.55$$

4.)

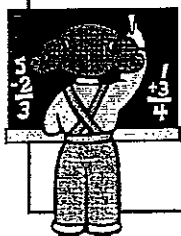
$$\frac{n}{7} = 5.55$$

5.)

$$12m = 84.72$$

6.)

$$\frac{p}{13} = 2.67$$



Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Divide decimals.

Example: Divide  $45.9 \div 3$

$$\begin{array}{r} 15.3 \\ 3 \overline{) 45.9} \\ \underline{-3} \phantom{0} \\ 15 \phantom{0} \\ \underline{-15} \phantom{0} \\ 9 \phantom{0} \\ \underline{-9} \phantom{0} \\ 0 \end{array}$$

Place decimal directly above the decimal point in the dividend

Divide as with whole numbers

1.)

$$4 \overline{) 12.5}$$

2.)

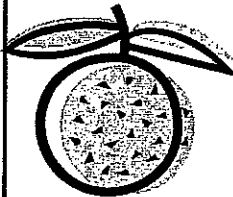
$$5 \overline{) 32.12}$$

3.)  $215 \div 10$

4.)  $3 \div 8$

5.) Maria and two of her friends shared the cost of their lunch. If the lunch cost \$15.90, how much would each one have to pay?

6.) If seven oranges cost \$4.13, how much would one orange cost?





## Level 6 (Course 1) Summer Math Packet

Unit: NUMBER RELATIONSHIPS and COMPUTATION

Objective: Multiply decimals.

Examples: Multiply  $3.4 \times 1.2$

$$\begin{array}{r}
 3.4 \\
 \times 1.2 \\
 \hline
 68 \quad \leftarrow \text{multiply 34 by 2 (ignore the decimal point)} \\
 + 340 \quad \leftarrow \text{multiply 34 by 10 (the 1 is in the tens place)} \\
 \hline
 408 \quad \leftarrow \text{add 68 and 340}
 \end{array}$$

Count the number of decimal places in the original problem.  
 Since there are 2 total decimal places, the answer should also have 2 decimal places.

$$\begin{array}{r}
 3.4 \quad (1 \text{ decimal place}) \\
 \times 1.2 \quad (1 \text{ decimal place}) \\
 \hline
 4.08 \quad 2 \text{ total decimal places}
 \end{array}$$

Answer 4.08

1.)  $1.2 \times 0.5$

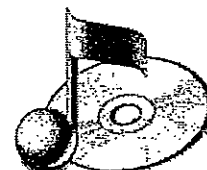
2.)  $3.3 \times 4.6$

3.)  $0.4 \times 0.6$

4.)  $7.89 \times 5$

5.) Turkey cost \$5.79 a pound. How much will 2.9 pounds of turkey cost? Round to the nearest cent.

6.) Ralph bought 6 CDs at a cost of 17.75 each. How much did the CDs cost altogether?



**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Multiply fractions and mixed numbers and express answers in simplest form.

**Multiplying Fractions and Mixed Numbers:**

- 1) Change Mixed numbers to improper fractions
- 2) Multiply numerators
- 3) Multiply denominators
- 4) Simplify if necessary

Try cross cancelling!

EX: multiply  $\frac{1}{2} \times \frac{3}{8}$

- 1) No mixed numbers
- 2)  $\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$
- 3)  $\frac{1}{2} \times \frac{3}{8} = \frac{3}{16}$
- 4) (can't be simplified)

EX: Multiply  $\frac{1}{3} \times 6\frac{3}{7}$

- 1)  $6\frac{3}{7} = \frac{45}{7}$  as an improper fraction
- 2)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 3)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 4) Simplified:  $\frac{45}{21} = 2\frac{1}{7}$

1.)  $\frac{5}{6} \times \frac{1}{2} =$

2.)  $\frac{9}{10} \times \frac{2}{3} =$

3.)  $2\frac{1}{2} \times 1\frac{2}{5} =$

4.)  $2\frac{1}{4} \times 3\frac{1}{3} =$

5.) Belinda lives  $1\frac{1}{2}$  times further from school than Jamie does. If Jamie lives  $4\frac{1}{5}$  miles from school, how far does Belinda live?

6.) Mario practices his guitar every day for  $\frac{3}{4}$  of an hour. How long does he practice for week?



## Level 6 (Course 1) – Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Add and subtract fractions and mixed numbers and express answers in simplest form.

**Adding and Subtracting Fractions:**

- 1) determine the least common denominator (LCD) of the fractions
- 2) rewrite each fraction as an equivalent fraction using the LCD
- 3) Add or subtract the fractions
- 4) Simplify if necessary

Common Denominators

EX: Add  $\frac{1}{2} + \frac{3}{8}$

- 1) LCD of 2 and 8 is 8
- 2)  $\frac{1}{2} = \frac{4}{8}$   
 $+\frac{3}{8} = \frac{3}{8}$   

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 $\frac{7}{8}$
- 3)  $\frac{7}{8}$
- 4) (can't be simplified)

EX: Subtract  $3\frac{3}{5} - 1\frac{1}{6}$

- 1) LCD of 5 and 6 is 30
- 2)  $3\frac{3}{5} = 3\frac{18}{30}$   
 $-1\frac{1}{6} = -1\frac{5}{30}$   

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 $2\frac{13}{30}$
- 3)  $2\frac{13}{30}$
- 4) (can't be simplified)

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

2.)  $\frac{11}{12} - \frac{5}{8} =$

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

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

5.) Shelly has two pieces of yarn. One is  $1\frac{1}{2}$  yards long and the other is  $2\frac{3}{4}$  yards long. How much yarn does she have altogether?

6.) Marty weighs  $64\frac{1}{4}$  pounds and Nathan weighs  $76\frac{1}{2}$  pounds. How much more does Nathan weigh than Marty?



**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Compare and order fractions and decimals.



**Ordering fractions only:**

- 1) determine the least common denominator (LCD) of the fractions
- 2) rewrite each fraction as an equivalent fraction using the LCD
- 3) Compare the numerators

**EX:** order the fractions  $\frac{1}{2}, \frac{3}{8}, \frac{7}{12}$  from least to greatest

1) LCD of 2, 8, and 12 is 24

2)  $\frac{1}{2} = \frac{12}{24}$

$\frac{3}{8} = \frac{9}{24}$

$\frac{7}{12} = \frac{14}{24}$

3) Comparing the numerators:

$\frac{3}{8} < \frac{12}{24} < \frac{14}{24}$

**Ordering fractions and decimals:**

- 1) Change the fractions to decimals
- 2) Compare the decimals



**EX:** order the numbers 0.3;  $\frac{3}{8}$ ; and 0.38 from least to greatest

1)  $\frac{3}{8} = 0.375$

$\frac{3}{8} = \frac{9}{24}$

$\frac{7}{12} = \frac{14}{24}$

2) Compare the decimals:

$0.3 < 0.375 < 0.38$

**Therefore:**  $0.3 < \frac{3}{8} < 0.38$

$$\begin{array}{r} 0.375 \\ 8 \overline{)3.000} \\ \underline{-24} \phantom{00} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

1.) Order the fractions  $\frac{2}{3}, \frac{5}{6}, \frac{3}{4}$  from least to greatest

2.) Order the numbers 0.78;  $\frac{3}{4}$ ; and 0.8 from least to greatest

3.) Order the fractions  $\frac{3}{5}, \frac{7}{10}, \frac{5}{6}$  from least to greatest

4.) Order the numbers  $\frac{3}{10}, \frac{1}{5}$ ; and 0.25 from least to greatest

5.) Order the fractions  $\frac{1}{2}, \frac{5}{9}, \frac{5}{6}$  from least to greatest

6.) Which number has the greatest value? 0.94;  $\frac{19}{20}$ ; or  $\frac{24}{25}$



# Level 6 (Course 1) Summer Math Packet

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Determine 10, 20, 25, or 50 percent of a whole number.

**Example:** Determine 25% of 40

**Method 1:**  
Change the percent to a fraction and multiply

$$25\% = \frac{1}{4}$$

$$\frac{1}{4} \times 40 = 10$$

Therefore 25% of 40 is 10.

**Method 2:** *Most Common*  
Change the percent to a decimal and multiply

$$25\% = 0.25$$

$$0.25 \times 40 = 10.00$$

Therefore 25% of 40 is 10.

$$\begin{array}{r} 40 \\ \times 0.25 \\ \hline 200 \\ +800 \\ \hline 10.00 \end{array}$$

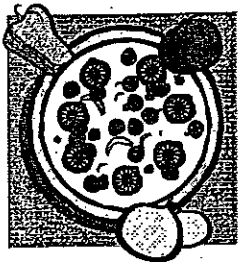
1.) Determine 20% of 65.

2.) Determine 50% of 120.

3.) Determine 25% of 20.

4.) Determine 10% of 35.

5.) 20% of the 250 students ate pizza for lunch. How many students ate pizza?



6.) Nia saved 10% on her CD purchase. If the CD originally cost \$24.90, how much did she save?

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - C.

**Key Concept: Ratio:** a comparison of two numbers

A ratio can be written in 3 ways: a:b  
a to b or  
 $\frac{a}{b}$

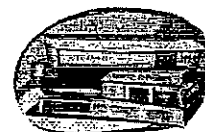
Don't over think  
Make sure you  
Simplify!

**EX:** Write the ratio as a fraction simplest form: **4 wins to 6 losses**

Since the ratio can be written as:  $\frac{4}{6}$  we can simplify to  $\frac{2}{3}$  or 2:3 or 2 to 3

1.) Write the ratio as a fraction simplest form:  
**12 boys to 15 girls**

2.) Write the ratio as a fraction simplest form:  
**20 books to 24 magazines**



3.) Write the ratio as a fraction simplest form:  
**10 circles to 15 triangles**

4.) Write the ratio as a fraction simplest form:  
**8 cups to 2 servings**

5.) Write the ratio as a fraction simplest form:  
**50 cars to 100 trucks**



6.) Write the ratio as a fraction simplest form:  
**9 pencils to 11 pens**

**Level 6 (Course 1) Summer Math Packet**

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - B.

**Key Concept:** Percent (%) is a ratio that compares a number to 100

*Both methods used*

**Fraction to Percent:**

EX: Change  $\frac{19}{25}$  to a percent

Since % means out of 100,  $\frac{19}{25} = \frac{?}{100}$

$$\frac{19}{25} = \frac{x4}{x4} = \frac{76}{100}$$

$$\frac{76}{100} = 76\%$$

**Percent to fraction:**

EX: Change 75% to a fraction in simplest form

75% means 75 out of 100

$$75\% = \frac{75}{100} \quad \text{Write the percent as a fraction with a denominator of 100}$$

$$\frac{75 \div 25}{100 \div 25} = \frac{3}{4} \quad \text{Simplify}$$

1.) Change  $\frac{17}{20}$  to a percent

2.) Change 84% to a fraction in simplest form

3.) Change  $\frac{3}{4}$  to a percent

4.) Change 90% to a fraction in simplest form

5.) Juan answered  $\frac{24}{25}$  questions correctly on his quiz.  
What percent of the questions did he get correct?

6.) 78% of the class completed their homework last night. What fraction of the class completed their homework?



**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Identify and determine equivalent forms of proper fractions as decimals, percents, and ratios - A.

**Examples:** Write  $\frac{21}{25}$  as a decimal

**Method 1:** *\*Easy when you can change*  
 Change  $\frac{21}{25}$  to a fraction with a denominator of 10, 100, or 1000

EX:  $\frac{21}{25} = \frac{?}{100}$

(Use 100, since 25 divides into 100 evenly)

$$\frac{21}{25} = \frac{x4}{x4} = \frac{84}{100} = \frac{84}{100} = 0.84 \text{ as a decimal}$$

**Method 2:** Divide 21 by 25 *\*Complex Numbers*

$$\begin{array}{r} \frac{21}{25} \rightarrow 25 \overline{)21.00} \\ \underline{0.84} \\ 21.00 \\ \underline{-200} \\ 100 \\ \underline{-100} \\ 0 \end{array}$$

Therefore:  $\frac{21}{25} = 0.84$

1.) Write  $\frac{19}{20}$  as a decimal. Use method 1

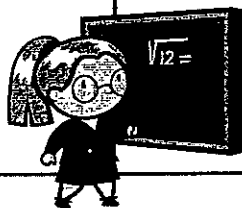
2.) Write  $\frac{7}{8}$  as a decimal. Use method 2.

3.) Write  $\frac{3}{16}$  as a decimal. Use method 2

4.) Write  $\frac{27}{40}$  as a decimal. Use method 2

5.) Write  $\frac{3}{4}$  as a decimal. Use method 1

6.) Write  $\frac{3}{5}$  as a decimal. Use method 1





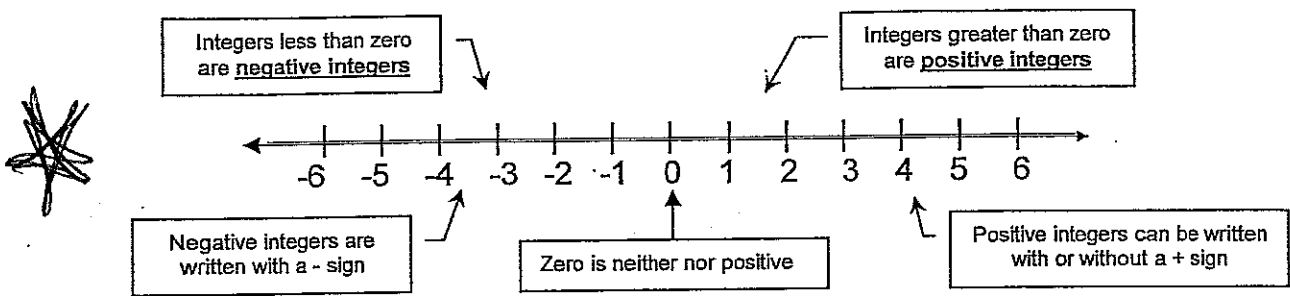
**Level 6 (Course 1) Summer Math Packet**

**Unit: NUMBER RELATIONSHIPS and COMPUTATION**

**Objective:** Read, write, and represent integers.

**Examples:**

**Integer:** Any number from the set {... -3,-2,-1,0,1,2,3...}




**Write an integer to describe each situation**

- EX:** a height increase of 3 inches  
*The word increase represents positive. The integer is 3 or +3.*
- EX:** 50 feet below sea level  
*The word below represents negative. The integer is -50.*

1.) Write an integer to describe:  
*The stock market increased 75 points*

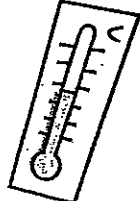
2.) Write an integer to describe:  
*A loss of 15 yards*



3.) Write an integer to describe the situation:  
*Nancy owes her friend \$10*

4.) Write an integer to describe:  
*Frederick is located 290 feet above sea level.*

5.) Write an integer to describe:  
*The temperature was 3° below zero*



6.) Write an integer to describe:  
*The 6<sup>th</sup> grade has 12 fewer students than last year*

