

Ansonia Public Schools ♦ Ansonia, Connecticut

## **MATH Summer Practice for a Student Entering Grade 7**

Name: \_\_\_\_\_

Please complete your summer review packet in preparation for seventh grade math. Please show as much work as you can for each problem. This will help if you are asked how you got your answer. **Do Not Use a Calculator.**

This packet was designed to help you retain important skills needed to move forward in Math. You are **highly encouraged** to complete this packet. It will be collected during the first week of school.

The reflection page at the back of the packet will be collected as well. Remember, all incoming seventh graders are expected to have their math facts mastered.

It's always good to practice. Here are some websites that make practicing fun!

- <https://www.ixl.com/signin/ansonیا> (Log On using your IXL username and password)
- <https://www.reflexmath.com/> (Log On using CLEVER)

**Due Date: This will be collected during the first week of school by the student's teacher. There will be an incentive for all students who turn in their math packet.**

## Table of Contents

Pages 1 - 2: Notes for Week 1

**Pages 3 - 4: Week 1 Questions**

Pages 5 - 7: Notes for Week 2

**Pages 8 - 9: Week 2 Questions**

Pages 10 - 11: Notes for Week 3

**Pages 12 - 13: Week 3 Questions**

**Pages 14 - 15: Week 4 Questions**

**Page 16: Reflection**

**\* Pages 3 - 4, 8 - 9, and 12 - 16 must be completed by  
September 13<sup>th</sup> \***

**\* Pages 1 - 2, 5 - 7, and 10 - 11 are notes for reference \***

## Week 1: Order of Operations, Evaluating Expressions, Equations

### *Order of Operations*

**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.)**

**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                              |

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### *Evaluating Expressions*

**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 its value |
|                              | 53       | solution                            |

## Equations

**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.

**Examples:**

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

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

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

- 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 is the divisor.
- **Division equations:** Multiply both sides of the equation by the divisor so that the two sides remain equal.

**Examples:**

$$\begin{array}{r} 4b = 16 \quad \text{original equation} \\ \hline 4 \quad 4 \quad \text{divide both sides by 4} \\ \hline 1b = 4 \quad \text{solution} \\ b = 4 \quad \text{simplify} \end{array}$$

$$\begin{array}{r} \frac{m}{6} = 11 \quad \text{original equation} \\ 6 \times \frac{m}{6} = 11 \times 6 \quad \text{multiply each side by 6} \\ \hline 1m = 66 \quad \text{solution} \\ m = 66 \quad \text{simplify} \end{array}$$

To check your solution to an equation.

- 1) Rewrite the original equation.
- 2) Substitute the solution for the variable.
- 3) Verify that both sides of the equal sign are equivalent.

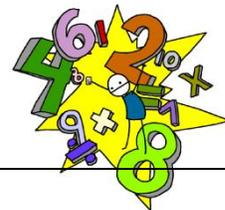
$$4b = 16$$

$$4(4) = 16$$

$$16 = 16$$

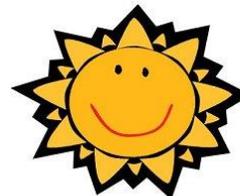


Week 1: Order of Operations, Evaluating Expressions, & Equations



|   |  |
|---|--|
| 1) Evaluate $150 + n$ , if $n = 15$                                   | 2) Evaluate $12n$ , if $n = 9$                                     |
| 3) Evaluate $15n + 19$ , if $n = \frac{1}{3}$                         | 4) Evaluate $24n + k$ , if $n = 2$ and $k = 8$                     |
| 5) Simplify the expression below.<br>$(8 + 1) \cdot 12 - 13$          | 6) Simplify the expression below.<br>$13(4) - 72 \div 8$           |
| 7) Simplify the expression below.<br>$100 \div 5^2 \cdot 4^3$         | 8) Simplify the expression below.<br>$88 - 16 \cdot 5 + 2 - 3$     |
| 9) Simplify the expression below.<br>$(5^2 + 3^3) + (81 + 9) \div 10$ | 10) Explain why it is important to follow the order of operations. |

Week 1: Order of Operations, Evaluating Expressions, & Equations



|   |  |
|---|--|
| 11) Solve and check $g + 5 = 12$          | 12) Solve and check $s - 12 = 29$                            |
| 13) Solve and check $m + 8 = 10$          | 14) Solve and check $k - 55 = 87$                            |
| 15) Solve and check $w + 3 = 14$          | 16) Solve and check $7x = 63$                                |
| 17) Solve and check $5b = 255$            | 18) Solve and check $\frac{x}{4} = 8$                        |
| 19) Solve and check<br>$\frac{g}{6} = 11$ | 20) Explain how a check is helpful when solving an equation. |

Week 2: Decimal and Fraction Operations, Integers

Decimal Operations

Adding and Subtracting

Follow these rules

- Find the decimal
- Line up decimals
- Fill in empty spots with zeros
- Add or Subtract
- It's that easy!!!!!!!



Line up the decimal points...

$$\begin{array}{r}
 528 + 7.49 \\
 528.00 \\
 + 7.49 \\
 \hline
 535.49
 \end{array}$$

Just turn that whole number into a decimal!

$$\begin{array}{r}
 3.8 - 1.26 \\
 3.80 \\
 - 1.26 \\
 \hline
 2.54
 \end{array}$$

Stick a zero in there so you can do your borrowing (regrouping)!

**Multiplying**

Objective: Multiply decimals.

Examples: Multiply 3.4 X 1.2

$$\begin{array}{r}
 3.4 \\
 \times 1.2 \\
 \hline
 68 \\
 + 340 \\
 \hline
 408
 \end{array}$$

68 ← multiply 34 by 2 (ignore the decimal point)  
 + 340 ← multiply 34 by 10 (the 1 is in the tens place)  
 408 ← add 68 and 340

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.

3.4 (1 decimal place)  
 X 1.2 (1 decimal place)  
 4.08 2 total decimal places

Answer 4.08

## Dividing

**Objective:** Divide decimals.

**Example:** Divide  $45.9 \div 3$

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

Place decimal directly above the decimal point in the dividend

Divide as with whole numbers

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## Fraction Operations

**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

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

1) LCD of 2 and 8 is 8

2)  $\frac{1}{2} = \frac{4}{8}$

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

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)  $3\frac{3}{5} = 3\frac{18}{30}$

$$-1\frac{1}{6} = -1\frac{5}{30}$$

3)  $2\frac{13}{30}$

4) (can't be simplified)

**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

**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**  $\frac{1}{3} \times 6\frac{3}{7}$

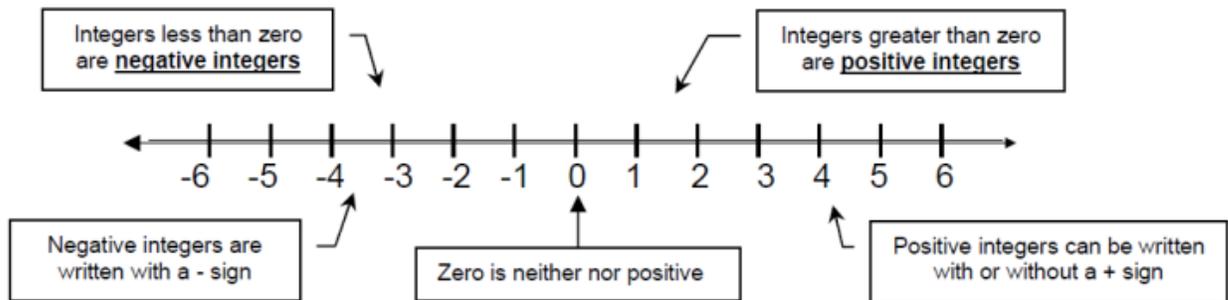
- 1)  $6\frac{3}{7} = \frac{45}{7}$  as an improper fraction
- 2)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 3)  $\frac{1}{3} \times \frac{45}{7} = \frac{45}{21}$
- 4) Simplified:  $\frac{45}{21} = 2\frac{1}{7}$

**Integers**

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

**Examples:**

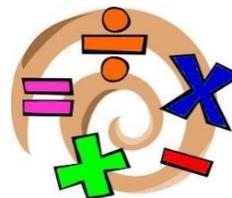
**Integer:** Any number from the set {... -3,-2,-1,0,1,2,3...}



**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.*

Week 2: Decimal and Fraction Operations, Integers



|   |  |
|---|--|
| 1) $3.25 + 21.061$  | 2) $32.05 - 7.6$   |
| 3) John and his two friends went out to lunch. Their lunches cost \$7.29, \$8.45, and \$5.99. If they each put in \$10, how much total change will they get back? | 4) $7.89 \times 0.2$   |
| 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. What was the total cost of the CDs. |
| 7) $12.5 \div 4$  | 8) $3 \div 8$  |
| 9) Maria and two of her friends went to the movies. The total cost was \$15.90. How much does each one have to pay?   | 10) If seven oranges cost \$4.13, how much would one orange cost?                    |

Week 2: Decimal and Fraction Operations, Integers



- (All answers should be in simplest form)

|  |  |
|--|--|
| <p>11) <math>\frac{4}{6} + \frac{1}{3}</math></p>  | <p>12) <math>3\frac{5}{6} - 1\frac{4}{5}</math></p>  |
| <p>13) Shelly has two pieces of yarn. One is <math>1\frac{1}{2}</math> yards long and the other is <math>2\frac{3}{4}</math> yards long. How much yarn does she have altogether?</p> | <p>14) Marty weighs <math>64\frac{1}{4}</math> pounds and Nathan weighs <math>76\frac{1}{2}</math> pounds. How much more does Nathan weigh than Marty?</p> |
| <p>15) <math>\frac{9}{10} \times \frac{2}{3}</math></p>  | <p>16) <math>2\frac{1}{4} \times 3\frac{1}{3}</math></p>   |
| <p>17) Belinda lives <math>1\frac{1}{2}</math> times further from school than Jamie does. If Jamie lives <math>4\frac{1}{5}</math> miles from school, how far does Belinda live?</p> | <p>18) Mario practices his guitar every day for <math>\frac{3}{4}</math> of an hour. How long does he practice for the week?</p>                           |
| <p>19) Write an integer to describe:<br/><i>Frederick is located 290 feet above sea level.</i></p>   | <p>20) Write an integer to describe:<br/><i>The 6<sup>th</sup> grade has 12 fewer students than last year.</i></p>   |

**Week 3: Converting to Fractions, Decimals, and Percents, Ratios, Percents**

***Converting Fractions to Decimals***

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

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

**Method 1:**

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)

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

**Method 2:** Divide 21 by 25

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

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

***Converting to Fractions, Decimals, and Percents***

| To convert from... | Fraction   | Decimal  | Percent   |
|--------------------|--|--|---|
| Fraction<br>→      |             | <i>Divide numerator by denominator</i>   | <i>Divide numerator by denominator, then multiply by 100</i>                          |
| Decimal<br>→       | <i>Write digits as a fraction over the place value the number is written to, then simplify</i> |  | <i>Multiply by 100</i>  |
| Percent<br>→       | <i>Write over 100, then simplify</i>   | <i>Divide by 100</i>   |  |

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

**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

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

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

**Ratios**

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

A ratio can be written in 3 ways: a:b

a to b or

$$\frac{a}{b}$$

**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

**Percents**

**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:**

Change the percent to a decimal and multiply

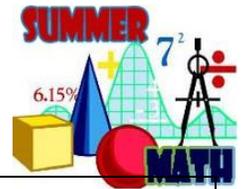
$$25\% = 0.25$$

$$0.25 \times 40 = 10.00$$

Therefore 25% of 40 is 10.

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

Week 3: Converting to Fractions, Decimals & Percents, Ratios, and Percents



|  |   |
|--|---|
| <p>1) Write <math>\frac{3}{4}</math> as a decimal<br/>use method 1 from reference sheet</p>                      | <p>2) Write <math>\frac{3}{5}</math> as a decimal.<br/>use method 1 from reference sheet</p>                          |
| <p>3) Write <math>\frac{27}{40}</math> as a decimal<br/>use method 2 from reference sheet</p>                    | <p>4) Write <math>\frac{7}{8}</math> as a decimal.<br/>use method 2 from reference sheet</p>                          |
| <p>5) Change <math>\frac{17}{20}</math> to a percent</p>   | <p>6) Change <math>\frac{3}{4}</math> to a percent</p>  |
| <p>7) Change 84% to a fraction in simplest form</p>  | <p>8) Change 90% to a fraction in simplest form</p>   |
| <p>9) John answered 24/25 questions correctly on his quiz. What percent of the questions did he get correct?</p> | <p>10) 78% of the class completed their homework last night. What fraction of the class completed their homework?</p> |

Week 3: Converting to Fractions, Decimals & Percents, Ratios, and Percents



|   |   |
|---|---|
| 11) Write the ratio as a fraction in simplest form: <b>10 circles to 15 triangles</b> | 12) Write the ratio as a fraction in simplest form: <b>8 cups to 2 servings</b>   |
| 13) Write the ratio as a fraction in simplest form: <b>9 pens to 11 pencils</b>       | 14) Determine 20% of 65   |
| 15) Determine 50% of 120  | 16) Determine 25% of 20   |
| 17) Determine 10% of 35   | 18) Determine 15% of 80   |
| 19) 20% of the 250 students ate pizza for lunch. How many students ate pizza?         | 20) Nina saved 10% on her CD purchase. If the CD originally cost \$24.90, how much would she save? What would the new price be? |



|  |   |
|--|---|
| <p>1) <math>98.5 + 7.68</math></p>   | <p>2) <math>45 - 22.75</math></p>   |
| <p>3) If <math>k = 9</math> evaluate <math>2k - 5</math></p>   | <p>4) If <math>k = 9</math> evaluate <math>\frac{k+9}{6}</math></p>   |
| <p>5) Susan earned \$75 babysitting this month. Her goal is to put 30% of her earnings into the bank every month. How much of her \$75 should she put in the bank to reach her goal?</p> | <p>6) Jaden lives <math>1\frac{3}{4}</math> miles from school. On the first day of school, his mom dropped him off in the morning. After school he walked home for a snack, then walked back to school for soccer practice, and finally walked home after practice. How many total miles did he walk?</p> |
| <p>7) Simplify the following expression.<br/><math>350 \div 5(3^2 + 1)</math></p>  | <p>8) Solve for the given variable.<br/><math>12y = 72</math></p>   |
| <p>9) <math>15.3 \times 2.75</math></p>  | <p>10) <math>5\frac{1}{2} \div \frac{3}{4}</math></p>   |

|   |  |
|---|--|
| <p>11) <math>\frac{5}{9} + \frac{2}{3}</math></p>   | <p>12) Solve for the given variable.</p> $\frac{m}{8} = 7$   |
| <p>13) Ms. Riess dug a hole 4 inches underground to plant tulips. If ground level represents zero, which integer represents the height of the hole?</p> | <p>14) Write <math>\frac{7}{20}</math> as a decimal AND a percent.</p>   |
| <p>15) Solve for the given variable.<br/><math>27 + a = 32</math></p>   | <p>16) <math>51.85 \div 3.4</math></p>   |
| <p>17) Pablo scored 85% on his spelling test. Write his score as a decimal and a fraction in simplest form.</p>   | <p>18) A litter of puppies has 6 females and 3 males. Write the ratio of female puppies to total puppies in simplest form.</p>                       |
| <p>19) Katie spent 25% of her 8 hour flight working on her summer math packet. For how many hours of her flight did she work on her packet?</p>         | <p>20) To calculate sales tax in Massachusetts, multiply the total spent by 0.065. Write this number as a percent and fraction in simplest form.</p> |



# Summer Math Packet Reflection

Name \_\_\_\_\_

*After completing your Summer Math Packet, please answer the following questions:*

1) List the Math skills and concepts that you are **most confident** with. In other words, which problems were the **easiest** for you to solve? (example... order of operations)

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2) List the Math skills and concepts that you found to be the most **difficult**. In other words, which problems were the **hardest** for you to solve? (example... dividing decimals)

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3) What are your **expectations for Math class this year**? What do you expect to learn? What do you expect Math class to be like?

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4) Write **two personal Math goals** to strive towards this school year.

*For example...*

*This year in Math class, I hope to memorize my Math facts.*

*I also want to get better at solving word problems.*

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