SUMMER MATH Packet

Grace Wilday Junior High School

For 7th grade students ascending into 8th grade

Dear Parents/Guardians,

With the end of the school year quickly upon us, we know that you are making plans for your child's summer activities. While the summer months are a welcome opportunity for fun and relaxation, the break from school activities often causes students to experience a lag in learning upon returning to school in the fall. This becomes more and more critical as students enter more challenging math classes in the middle and upper school grades.

In order to maintain the academic gains your child worked so hard for this year, the mathematics teachers at Grace Wilday Junior High School created a summer packet for incoming 8th graders. It is our hope this will help to better prepare them for the upcoming school year.

The summer packet is broken down into units. Each unit has examples and some helpful links that further explain the topics. All work will be due on Monday, September 14, 2020. Please encourage your child to try their best and have fun with this summer work! Thank you for your continued support and we look forward to working with you next school year. Have a great summer!

Sincerely,

The Math Department

Grace Wilday Junior High School

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Complete a function table with a given two operation rule

The solution of an equation with two variables consists of two numbers, one for each variable, that make the equation true. The solution is usually written as an ordered pair.
https://tinyurl.com/y6n6eq9h

Example: The cost to rent a bicycle at the beach includes a rental fee of 5 dollars plus 3 dollars for each hour. The equation for the cost of renting a bicycle is

C=3H+5 **C** is the total cost
H is the number of hours

Bicycle Rentals		
Hours	**3H+5**	**Cost (dollars)**
1	3(1)+5	8
2	3(2)+5	11
3	3(3)+5	14

Complete the following tables:

1.)

C = 3H + 4

H	3H + 4	C
2	3(2) + 4	
4		
6		
10		

2.)

Y = 5X + 2

X	5X + 2	Y
3		
6		
9		
12		

3.)

Y = 5X - 3

X	5X – 3	Y
1	5(1) – 3	2
2		
3		
4		

4.)

A = 4B - 3

B	4B – 3	A
3		
4		
5		
6		

5.)

Y = 2 + 10X

X	2 + 10X	Y
3	2 + 10(3)	32
4		
5		

6.)

6B – 1 = A

B	6B – 1	A
8	6(8) – 1	47
10		
12		

Unit: Knowledge of Algebra, Patterns, and Functions

Objective: Evaluate an algebraic expression using one unknown and no more than 2 operations.

Example 1: Evaluate $6x - 7$ if $x = 8$.

$6x - 7 = 6(8) - 7$	Replace x with 8.
$= 48 - 7$	Use order of operations.
$= 41$	Subtract 7 from 48.

Example 2: Evaluate $5m - 15$ if $m = 6$.

$5m - 15 = 5(6) - 15$	Replace m with 6..
$= 30 - 15$	Use order of operations.
$= 15$	Subtract 15 from 30.

Example 3: Evaluate $\frac{7b}{3}$ if $b = 6$.

$\frac{7b}{3} = \frac{(7)(6)}{3}$	Replace b with 6
$= \frac{42}{3}$	Multiply 6 by 7
$= 14$	Divide 42 by 3

Example 4: Evaluate $x^3 + 4$ if $x = 3$.

$x^3 + 4 = 3^3 + 4$	Replace x with 3
$= 27 + 4$	Use order of operations
$= 31$	Add 27 and 4

Evaluate the following expressions using the given values for a, b, and c. Show each step!

1.) Evaluate $6 + 3b$ if $b = 7$

2.) Evaluate $6a^2$ if $a = 4$

3.) Evaluate $5(6) - c$ if $c = 7$

4 .) Evaluate b^4 if $b = 2$

5.) Evaluate $\frac{7.5m}{5}$ if $m = 2$

6.) Evaluate $\frac{(n)^2}{3}$ if $n = 9$

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Evaluate numeric expressions using order of operations with no more than 4 operations.
https://tinyurl.com/gm9chnk

Use the order of operations to evaluate numerical expressions.
1. Do all operations within grouping symbols first.
2. Evaluate all powers before other operations.
3. Multiply and divide in order from left to right.
4. Add and subtract in order from left to right.

Example 1: Evaluate $14 + 3(7 - 2) - 2 \quad 5$

$14 + 3(7 - 2) - 2 \quad 5$

$= 14 + 3(5) - 2 \quad 5$ **Subtract first since 7 – 2 is in parentheses**

$= 14 + 15 - 2 \quad 5$ **Multiply left to right, 3 5 = 15**

$= 14 + 15 - 10$ **Multiply left to right, 2 5 = 10**

$= 29 - 10$ **Add left to right, 14 + 15 = 29**

$= 19$ **Subtract 10 from 29**

Example 2: $8 + (1 + 5)^2 \div 4$

$8 + (1 + 5)^2 \div 4$

$= 8 + (6)^2 \div 4$ **Add first since 1 + 5 is in parentheses**

$= 8 + 36 \div 4$ **Find the value of 6^2**

$= 8 + 9$ **Divide 36 by 4**

$= 17$ **Add 8 and 9**

Evaluate each of the following. Show each step!

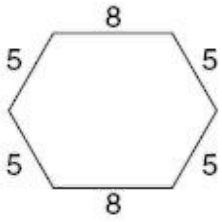
1.) $(2 + 10)^2 \div 4$

2.) $(6 + 5)\ (8 - 6)$

3.) $72 \div 3 - 5(2.8) + 9$

4.) $14(10 - 8) - 60$

5.) The perimeter of a hexagon is found by adding the lengths of all six sides of the hexagon. For the hexagon below write a numerical expression to find the perimeter. Then evaluate the expression.



6.) Without parentheses, the expression $8 + 30 \div 2 + 4$ equals 27. Place parentheses in the expression so that it equals 13; then 23.

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Determine the unknown in a linear equation with 1 or 2 operations
https://tinyurl.com/yxu7p7yv

Remember, equations must always remain balanced.

- If you add or subtract the same number from each side of an equation, the two sides remain equal.
- If you multiply or divide the same number from each side of an equation, the two sides remain equal.

Example 1: Solve x + 5 = 11

x + 5 = 11	Write the equation	⇨	**x + 5 = 11**	Write the equation
- 5 = - 5	Subtract 5 from both sides	**Check**	**6 + 5 = 11**	Replace x with 6
x = 6	Simplify		**11 = 11**	Is the sentence true?

Example 3: Solve 3x + 2 = 23

3x + 2 = 23	Write the equation		**3x + 2 = 23**	Write the equation
- 2 = - 2	Subtract 2 from each side	⇨	**3(7) + 2 = 23**	Replace x with 7
3x = 21	Simplify	**Check**	**21 + 2 = 23**	Multiply
3 3	Divide each side by 3		**23 = 23**	Add – is the sentence true?
x = 7	Simplify			

1.) Solve **x – 9 = -12**

2.) Solve **48 = - 6r**

3.) Solve **2t + 7 = -1**

4.) Solve **4t + 3.5 = 12.5**

5.) It costs $12 to attend a golf clinic with a local pro. Buckets of balls for practice during the clinic cost $3 each. How many buckets can you buy at the clinic if you have $30 to spend?

6.) An online retailer charges $6.99 plus $0.55 per pound to ship electronics purchases. How many pounds is a DVD player for which the shipping charge is $11.94?

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Solve for the unknown in an inequality with one variable.
https://tinyurl.com/y25y2dlp

An **inequality** is a mathematical sentence that contains the symbols $<$, $>$, $\leq$, or $\geq$.

Words	Symbols
m is greater than 7.	$m > 7$
r is less than -4.	$r < -4$
t is greater than or equal to 6.	$t \geq 6$
y is less than or equal to 1.	$y \leq 1$

Example 1: Solve **v + 3 < 5**

v + 3 < 5 Write the inequality
- 3 < - 3 Subtract 3 from each side
v < 2 Simplify

Check: Try 1, a number less than 2

v + 3 < 5 Write the inequality
1 + 3 < 5 Replace **v** with **1**
4 < 5 Is this sentence true?

Example 2: Solve **2x + 8 < 24**

2x + 8 < 24 Write the inequality
x < 8 Simplify

Check: Try 7, a number less than 8

2x + 8 < 24 Write the inequality
2(7) + 8 < 24 Replace **x** with **7**
14 + 8 < 24 Multiply 7 by 2
22 < 24 Is the sentence true?

1.) Solve **y + 5 ≤ 14**

2.) Solve **6u ≥ 36**

3.) Solve **5y + 1 < 36**

4.) Solve **4x – 6 > -10**

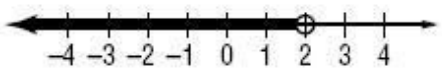
5.) The speed limit on highways in Florida is 70 miles per hour. Write and solve an inequality to find how long it will take you to travel the 105 miles from Orlando to St. Augustine if you travel at or below the speed limit.

6.) You have $80. Jeans cost $29 and shirts cost $12. Mom told you to buy one pair of jeans and use the rest of the money to buy shirts. Use this information to write and solve an inequality. How many shirts you can buy?

Unit: Knowledge of Algebra, Patterns, and Functions
Objective: Identify or graph solutions of inequalities on a number line.
https://tinyurl.com/y53o3t5w

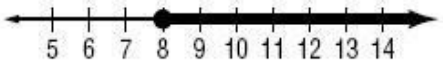
Examples: Graph each inequality on a number line.

x < 2



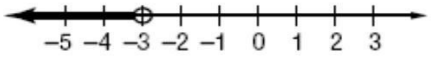
The open circle means that the number is **not** included in the solution.

y ≥ 8



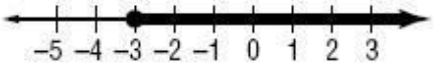
The closed circle means that the number **is** included in the solution.

m < - 3

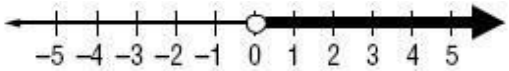


The solution is all numbers less than -3.
-3 is **not** included in the solution.

1.) Write an inequality for the graph.

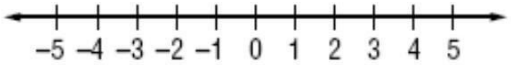


2.) Write an inequality for the graph.



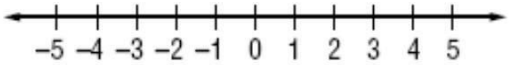
3.) Graph the inequality.

b ≥ - 1



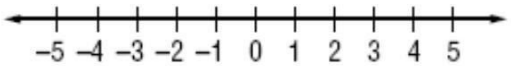
4.) Graph the inequality

z < 3



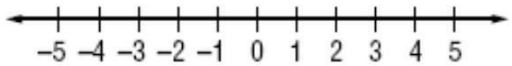
5.) Solve the inequality, then graph it on the number line.

y + 9 ≤ 13



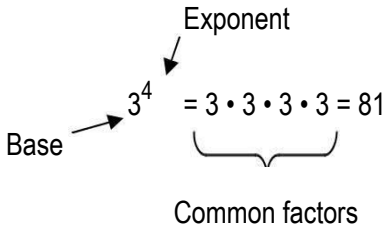
6.) Solve the inequality, then graph it on the number line.

4x – 6 > -10



Unit: Knowledge of Number Relationships & Computation
https://tinyurl.com/je5sopo

Objective: Read, write, and represent whole numbers using exponential notation.
Examples:



Write 6^3 as a product of the same factor.

Base = 6, so the exponent 3 means that 6 is used as a factor 3 times.
ANSWER: $6^3 = 6 \cdot 6 \cdot 6$

Write 4 • 4 • 4 • 4 • 4 in exponential form.

Base = 4. It is used as a factor 5 times so the exponent is 5.
ANSWER: $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 = 4^5$

1.) Write 15^4 as a product of the same factor.

2.) Write 2^7 as a product of the same factor.

3.) Evaluate (Solve) 7^3.

4.) Evaluate 8^4.

5.) Write 9 • 9 • 9 • 9 • 9 in exponential form.

6.) Write 12 • 12 • 12 in exponential form.

Unit: Knowledge of Number Relationships & Computation
Objective: Determine equivalent forms of rational numbers expressed as **fractions,** decimals, **percents, and ratios**.

Examples:

A RATIO is a comparison of two numbers by division. When a ratio compares a number to 100, it can be written as a PERCENT. To write a ratio or fraction as a percent, find an equivalent fraction with a denominator of 100. You can also use the meaning of percent to change percents to fractions.

*** Write 19/20 as a percent.**

$\frac{19 \cdot 5}{20 \cdot 5} = \frac{95}{100} = 95\%$ **Since 100 ÷ 20 = 5, multiply the numerator and denominator by 5.**

***Write 92% as a fraction in simplest form.**

$\frac{92}{100} = \frac{14}{14} = \frac{23}{25}$

***Write 92% as a decimal.** **Move decimal 2 places to the left. Add zeros if needed.**

92%=0.92

***Write 0.4 as a percent.** **Move decimal two places to the right. Add zeros if needed.**

0.4=40%

1.) Write $\frac{7}{25}$ as a percent and decimal.

2.) Write 19% as a decimal and fraction in simplest form.

3.) Write $\frac{9}{50}$ as a percent and decimal.

4.) Write 75% as a decimal and fraction in simplest form.

5.) Ms. Crest surveyed her class and found that 15 out of 30 students brushed their teeth more than twice a day. Write this ratio as a fraction in simplest form, then write it as a % and a decimal.

6.) A local retail store was having a sale and offered all their merchandise as a 25% discount. Write this percent as a fraction in simplest form, then write it as a decimal.

Unit: Knowledge of Number Relationships & Computation
Objective: Compare, order, and describe rational numbers.
https://tinyurl.com/tha7stu

Examples:

- **RATIONAL numbers include fractions, decimal, and percents. To COMPARE or ORDER rational numbers, they must be in the same form (all fractions, all decimals, or all %s)**

Example:
Order 0.6, 48%, and $\frac{1}{2}$ from least to greatest.

Step 1 – Change all to decimals. **0.6** **48% = 0.48**
½ = 0.5

Step 2 – Compare decimals & Order. **0.48, 0.5, 0.6**

Step 3 - Write using original form. **48%, ½ , 0.6**

1.) Order from least to greatest.

$$22\%,\ 0.3,\ \frac{1}{5}$$

2.) Order from least to greatest.

$$0.74,\ \frac{3}{4},\ 70\%$$

3.) Replace ◯ with <, > , or =.

$$\frac{7}{12} \bigcirc 58\%$$

4.) Which is the largest?

$$1\frac{3}{8} \qquad 1\frac{3}{10} \qquad 1\frac{4}{9}$$

5.) According to the Pet Food Manufacturers Association, 11 out of 25 people own large dogs and 13 out of 50 medium dogs. Do more people own large or medium dogs?

6.) Your PE teacher asked you to run for specific time period. You ran 0.6 of the time. Two of your friends ran $\frac{7}{10}$ and 72% of the time. Order the amount of time you and your friends ran from least to greatest.

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, multiply and divide integers.
https://tinyurl.com/ht6jmyp

Examples:
ADDITION INTEGER RULES:

For integers with the same sign:

- **The sum of two positive integers is POSITIVE.**
- **The sum of two negative integers is NEGATIVE.**

For integers with different signs, subtract their absolute value. The sum is:

- **Positive IF the positive integer has the greater absolute value.**
- **Negative IF the negative integers has the greater absolute value.**

Examples:
- 6 + (- 3) = add keep the sign = - 9 **- 34 + (- 21) = add keep the sign = - 55**

8 + (- 7) = subtract keep the sign of the higher = 1 **- 5 + 4 = subtract keep the sign of the higher = - 1**

SUBTRACTION INTEGER RULES:

- **Keep the first number the same**
- **Switch the subtraction sign to ADDITION**
- **Change the second number to its opposite. Opposite: - 6 to 6**
- **Follow Addition rules above.**

Examples:
6 – 9 = 6 + (- 9) = -3 **- 10 – (- 12) = - 10 + 12 = 2**

- 3 – 7 = - 3 + (- 7) = - 10 **1 – (- 2) = 1 + 2 = 3**

1.) Add: 2 + (- 7)

2.) Subtract: - 13 - 8

3.) Evaluate a – b if a = - 2 and b = - 7

4.) Evaluate x + y + z if x = 3, y = - 5, and z = - 2

5.) In Mongolia the temperature can dip down to -45^{o} C in January. The temperature in July may reach 40^{o} C. What is the temperature range in Mongolia?

6.) Write an addition expression to describe skateboarding situation. Then determine the sum.
Hank starts at the bottom of a half pipe 6 feet below street level. He rises 14 feet at the top of his kickturn.

Unit: Knowledge of Number Relationships & Computation
Objective: Add, subtract, **multiply and divide** integers.
https://tinyurl.com/hoknt5h

Examples:
MULTIPLYING & DIVIDING INTEGER RULES:

- **Two integers with DIFFERENT signs the answer is NEGATIVE.**
- **Two integers with SAME signs the answer is POSITIVE.**

Examples:
5 (- 2) = 5 times – 2, the signs are different so the answer will be negative = - 10

(- 6) • (- 9) = the signs are the same so the answer will be positive = 54

30 ÷ (- 5) = the signs are different so the answer will be negative = - 6

- 100 ÷ (- 5) = the signs are the same so the answer will be positive = 20

1.) Multiply**:** - 14 (- 7)

2.) Divide: 350 ÷ (- 25)

3.) Evaluate if a = - 3 and c = 5

-3ac

4.) Evaluate if d = - 24, e = - 4, and f = 8

$$\frac{de}{f}$$

5.) A computer stock decreased 2 points each hour for 6 hours. Determine the total change in the stock value over the 6 hours.

6.) A submarine descends at a rate of 60 feet each minute. How long will it take it to descend to a depth of 660 feet below the surface?

Math Games

Below is a list of websites with math activities. Document what your child completes on the chart found at the end of this document and sign it. Have your child hand in this chart, along with this packet.

https://www.khanacademy.org/math/cc-eighth-grade-math

https://www.khanacademy.org/math/cc-seventh-grade-math

https://www.ixl.com/math/grade-8

https://www.funbrain.com/games/line-jumper

https://www.quia.com/ba/89548.html

https://www.arcademics.com/games/speedway

https://www.hoodamath.com/games/eighth-grade.html

http://www.hoodamath.com/games/seventh-grade.html

http://www.shodor.org/interactivate/activities/ArithmeticFour/

https://www.khanacademy.org/computing/hour-of-code/hour-of-code-tutorial

https://www.quia.com/rr/199965.html

https://www.quia.com/rr/195128.html?AP_rand=1751104474

Grace Wilday Summer Math Log

Date	Description of Activity	Time Spent	Parent/Guardian Initials
Example: *7/8/20*	*KHAN Academy Combining Like Terms*	*20 min*	