



Nicholas A. Ferri Middle School

10 Memorial Avenue, Johnston, RI 02919

2019 Summer Math Practice — GRADE 8

WHAT! You want us to do MATH...in the SUMMER???

The students will be given math packets to complete over the course of the summer. These packets have been designed to review topics that were taught to them this past school year that teachers have identified as crucial for success in the next grade level. For optimal results, it is highly recommended that they complete a portion of the packet each week. This will ensure that skills are being reinforced weekly and that the students do not become overwhelmed. You are also expected to know all of your multiplication facts when you come to Ferri. Please make sure to practice these over the summer. 🤖

Summer Brain Drain!



Did you know...

Research has found that on average, ALL students lose approximately 2.6 months of grade level equivalency in math skills over the summer months. This is almost one-third of a typical school year!

Get off of those video games!

There are better ways to spend 20 minutes a day!

One of the goals of every FERRI Student is to be FLUENT with their multiplication facts. There are lots of cool websites to help you practice these over the summer. Here are a few;

<http://www.math-play.com>

www.hoodamath.com

www.coolmath.com

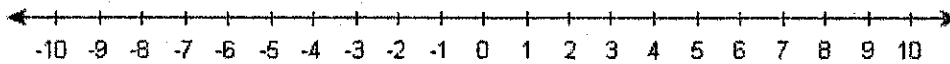
<http://www.mathplayground.com>

<http://www.multiplication.com/games>

<http://www.fun4thebrain.com/mult.html>

<http://www.funbrain.com>

Topic: Integers



Examples:

Addition	Subtraction	Multiplication	Division
<p><i>Same signs: Add & keep sign</i></p> $+6 + +5 = +11$ $-8 + -2 = -10$	<p><i>Keep-Change-Opposite (Add the opposite)</i></p> $+10 - -8 = +10 + +8 = 18$	<p><i>Same signs: Positive product</i></p> $(+7)(+8) = +56$ $(-2)(-6) = +12$	<p><i>Same signs: Positive quotient</i></p> $+42 \div +6 = +7$ $-24 \div -8 = +3$
<p><i>Different signs: Subtract & take sign of larger value</i></p> $+9 + -5 = +4$ $-6 + +1 = -5$	$-5 - +12 = -5 + -12 = -17$ $-20 - -8 = -20 + +8 = -12$	<p><i>Different signs: Negative product</i></p> $(+3)(-9) = -27$ $(-5)(+4) = -20$	<p><i>Different signs: Negative quotient</i></p> $+56 \div -7 = -8$ $-50 \div +2 = -25$

Recall the **order of operations**:

- 1 - Parentheses (or grouping symbols)
- 2 - Exponents
- 3 - Multiplication / Division (left to right)
- 4 - Addition/Subtraction (left to right)

Find each answer.

1. $-12 + -7 = \underline{\hspace{2cm}}$

2. $-25 + 18 = \underline{\hspace{2cm}}$

3. $2 + -25 = \underline{\hspace{2cm}}$

4. $-28 - -8 = \underline{\hspace{2cm}}$

5. $11 - -5 = \underline{\hspace{2cm}}$

6. $-21 - 4 = \underline{\hspace{2cm}}$

7. $(-9)(-8) = \underline{\hspace{2cm}}$

8. $(2)(-12) = \underline{\hspace{2cm}}$

9. $-35 \div -7 = \underline{\hspace{2cm}}$

10. $-48 \div +8 = \underline{\hspace{2cm}}$

11. $(-2)(+6)(-5) = \underline{\hspace{2cm}}$

12. $-30 + 24 \div 6 \cdot -2 = \underline{\hspace{2cm}}$

13. $16 \div 4 + 2 \cdot -8 = \underline{\hspace{2cm}}$

14. $-3(1-8) + 2^3 = \underline{\hspace{2cm}}$

**** Practice your INTEGER RULES using websites and on-line games!! You really MUST know these!! ****

Adding and Subtracting Integers

Hints/Guide:

To add integers with the same sign (both positive or both negative), add their absolute values and use the same sign. To add integers of opposite signs, find the difference of their absolute values and then take the sign of the larger absolute value.

To subtract integers, add its additive inverse.

For example $6 - 11 = a$ becomes $6 + -11 = a$ and solves as $-5 = a$.

Exercises: Solve the following problems: No Calculators!

1. $6 + (-7) =$

2. $(-4) + (-5) =$

3. $6 + (-9) =$

4. $(-6) - 7 =$

5. $6 - (-6) =$

6. $7 - (-9) =$

7. $5 + (-8) =$

8. $-15 + 8 =$

9. $14 + (-4) =$

10. $-9 - (-2) =$

11. $-7 - 6 =$

12. $-8 - (-19) =$

13. $29 - 16 + (-5) =$

14. $-15 + 8 - (-19) =$

15. $45 - (-13) + (-14) =$

16. $-15 - 6 - 9 =$

17. $-7 + (-6) - 7 =$

18. $29 - 56 - 78 =$

19. $17 + (-7) - (-5) =$

20. $45 - (-9) + 5 =$

Multiplying and Dividing Integers

Hints/Guide:

The rules for multiplying integers are:

Positive x Positive = Positive

Positive x Negative = Negative

Negative x Negative = Positive

Negative x Positive = Negative

The rules for dividing integers are the same as multiplying integers.

Exercises: Solve the following problems:

No Calculators!

1. $4 \cdot (-3) =$

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

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

4. $\frac{-14}{2} =$

5. $\frac{28}{-4} =$

6. $\frac{-36}{-6} =$

7. $6(-5) =$

8. $8(-4 - 6) =$

9. $-6(9 - 11) =$

10. $\frac{(-5)(-6)}{-2} =$

11. $\frac{6(-4)}{8} =$

12. $\frac{-56}{2^3} =$

13. $\frac{-6 - (-8)}{-2} =$

14. $-7 + \frac{4 + (-6)}{-2} =$

15. $45 - 4(5 - (-3)) =$

16. $(-4 + 7)(-5 + 3) =$

17. $16 - (-3)(-7 + 5) =$

18. $\frac{4 + (-6) - 5 - 3}{-6 + 4} =$

Rounding

Rounding a numerical value means replacing it by another value that is approximately equal but has a shorter, simpler, or more explicit representation. We round numbers to a specific place value. UNDERLINE the place value you're rounding to. Then check the place to the right and decide whether to keep it the same or round up.

Round each of the following decimals to the nearest tenth. Write your answer on the blank.

1. 87.46 _____

4. 8.862 _____

2. 13.4395 _____

5. 654.839 _____

3. 23.648 _____

6. 32.971 _____

Round each of the following decimals to the nearest hundredth. Write your answer on the blank.

7. 26.879 _____

9. 429.76492 _____

8. 675.495132 _____

10. 3.8961 _____

Round each of the following decimals to the nearest thousandth. Write your answer on the blank.

11. 653.0985 _____

14. 1.9970 _____

12. 9.0019 _____

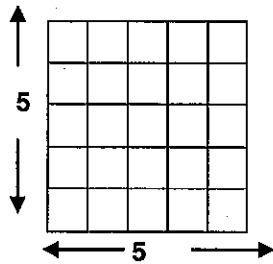
15. 13.1121 _____

13. 11.54001 _____

16. 90.3456 _____

Topic: Square roots

The square of 5 is 25.
 $5 \cdot 5 = 5^2 = 25$



The square root of 25 is 5 because $5 \cdot 5 = 25$ OR $5^2 = 25$.

The square of an integer is called a **perfect square**.
The **square root** of a perfect square is an integer.

Complete the T-Chart below. You must know these perfect squares.

Square Root of a Perfect Square	Integer Value
$\sqrt{1}$	
$\sqrt{4}$	
$\sqrt{9}$	
$\sqrt{16}$	
$\sqrt{25}$	
$\sqrt{36}$	
$\sqrt{49}$	
$\sqrt{64}$	
$\sqrt{81}$	
$\sqrt{100}$	
$\sqrt{121}$	
$\sqrt{144}$	
$\sqrt{169}$	
$\sqrt{196}$	
$\sqrt{225}$	

Combining like terms and applying the Distributive Property

In algebraic expressions, like terms are terms that contain the same variables raised to the same power. Only the coefficients of like terms may be different.

In order to **combine like terms**, we add or subtract the numerical coefficients of the like terms using the Distributive Property: $ax + bx = (a + b)x$.

Examples:

1. $2x + 9x = (2 + 9)x = 11x$

2. $12y - 7y = (12 - 7)y = 5y$

3. $5x + 8 - 2x + 7 = 3x + 15$

Here, the like terms are: $5x$ and $-2x = 3x$

and: $8 + 7 = 15$

The **Distributive Property** of multiplication over addition/subtraction is frequently used in Algebra:

Examples:

1. $7(2x + 9) = 7 \square 2x + 7 \square 9 = 14x + 63$

2. $4(6 - 5x) = 4(6) - 4(5x) = 24 - 20x$

Simplify each expression by combining like terms.

1. $8y + 2y$

2. $10 - 6y + 4y + 9 =$

3. $3x + 7 - 2x =$

4. $8n - 7y - 12n + 5 - 3y =$

Apply the distributive property and write your answer in simplest form.

5. $7(x - 4) =$

6. $5(4n - 3) =$

7. $-6(3y + 5)$

Translate each sentence to an algebraic equation. Then use mental math to find the solution.

	Equation	Solution
8. One-half of a number is -12.	Ex. $1/2n = -12$	$n = -6$
9. 6 more than 7 times a number is 41.	_____	_____
10. 5 less than three times a number is 10.	_____	_____
11. 16 increased by twice a number is -24.	_____	_____
12. eight multiplied by a number is 86.	_____	_____
13. 56 divided by a number is 7.	_____	_____
14. a number times itself is 49.	_____	_____

Topic: Factors

Factors are numbers that are multiplied to get a product. Factors are numbers which a given number is *divisible* by.

Ex. List the factors of 20:

1, 2, 4, 5, 10, 20

20 has 6 different factors

The **Greatest Common Factor (GCF)** of 2 or more numbers is the largest number that is a *divisor* of the given numbers.

Ex. The GCF of 30 and 24 is 6.

Common factors of 30 and 24 are 1, 2, 3 and 6.

The **Least Common Multiple (LCM)** of 2 or more numbers is the smallest number which is *divisible* by each of the given numbers. The LCM is the same as the least common denominator of 2 fractions.

Ex. The LCM of 6 and 10 is 30.

Note: Recall, you also had a method for finding the GCF and LCM by making a **Venn diagram** with the prime factorization of the numbers.

List all the factors of each of the following numbers. Then count how many different factors the number has.

Number of factors:

- Factors of 28: _____
- Factors of 40: _____
- Factors of 45: _____
- Factors of 36: _____
- Factors of 100: _____

Find the Greatest Common Factor (GCF) for each pair of numbers. (The GCF is the greatest divisor of the numbers.)

- GCF of 14 and 21 = _____
- GCF of 24 and 16 = _____
- GCF of 45 and 30 = _____
- GCF of 60 and 20 = _____
- GCF of 6 and 25 = _____
- GCF of 8 and 60 = _____

Find the Least Common Multiple (LCM) for each pair of numbers.

- LCM of 4 and 6 = _____
- LCM of 5 and 7 = _____
- LCM of 9 and 12 = _____
- LCM of 20 and 80 = _____
- LCM of 6 and 10 = _____
- LCM of 40 and 32 = _____

18. Write the prime factorization of each number using exponents (remember... make a factor tree!).

40

72

45

700

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

1.)

$$(8 + 1) \times 12 - 13$$

2.)

$$13 \times 4 - 72 \div 8$$

3.)

$$88 - 16 \times 5 + 2 - 3$$

4.)

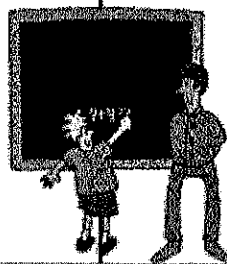
$$100 \div 5^2 \times 4^3$$

5.)

$$45 \div 9 - 3 + 2 \times 3$$

6.)

$$(5^2 + 3^3) \times (81 \div 9) + 10$$



Order of Operations

All work must be shown on this paper to receive full credit. Make sure to read the directions for each section. Place your answers on the correct section of the answer sheet.

Evaluate each expression.

1. $10+6\times 2$

2. $(15+39) \div 6$

3. $(20-15) \times 2+1$

4. $(4^2+6) \div 11$

5. $9+(7-1) \times 2$

6. $(2 \times 4)+8-(5 \times 3)$

7. $5+18 \div 3^2-1$

8. $8+5 \times 10-12$

9. $14+(50-7^2) \times 3$

Please show all work in packet. Write final answers on THIS SHEET and turn in with your packet. NO CALCULATORS!

Integers	Add/Sub Int.	Mult/Div Int.	Rounding	Square Root	Combining Like Terms/Exp.	Factors	Order of Operations
1. _____	1. _____	1. _____	1. _____	1. _____	1. _____	1. _____	1. _____
2. _____	2. _____	2. _____	2. _____	2. _____	2. _____	2. _____	2. _____
3. _____	3. _____	3. _____	3. _____	3. _____	3. _____	3. _____	3. _____
4. _____	4. _____	4. _____	4. _____	4. _____	4. _____	4. _____	4. _____
5. _____	5. _____	5. _____	5. _____	5. _____	5. _____	5. _____	5. _____
6. _____	6. _____	6. _____	6. _____	6. _____	6. _____	6. _____	6. _____
7. _____	7. _____	7. _____	7. _____	7. _____	7. _____	7. _____	7. _____
8. _____	8. _____	8. _____	8. _____	8. _____	8. _____	8. _____	8. _____
9. _____	9. _____	9. _____	9. _____	9. _____	9. _____	9. _____	9. _____
10. _____	10. _____	10. _____	10. _____	10. _____	10. _____	10. _____	10. _____
11. _____	11. _____	11. _____	11. _____	11. _____	11. _____	11. _____	11. _____
12. _____	12. _____	12. _____	12. _____	12. _____	12. _____	12. _____	12. _____
13. _____	13. _____	13. _____	13. _____	13. _____	13. _____	13. _____	13. _____
14. _____	14. _____	14. _____	14. _____	14. _____	14. _____	14. _____	14. _____
	15. _____	15. _____	15. _____	15. _____		15. _____	15. _____
	16. _____	16. _____	16. _____			16. _____	16. _____
	17. _____	17. _____	17. _____			17. _____	17. _____
	18. _____	18. _____	18. _____			18. _____	18. _____
	19. _____						19. _____
	20. _____						20. _____