Accelerated Math Summer Practice for 8th Grade Success

June 20, 2017

Waconia Middle School
1400 Community Drive
Waconia, MN 55387

Dear Accelerated Students and Parent/Guardians,

Welcome to 8th Grade Accelerated Math! The teachers look forward to working with you next fall. Enclosed you will find a packet with a list of skills that you will need to have mastered before school starts. Inside the packet, there are examples and practice problems for you to do. Answers are also provided at the end of the packet to check your work. There are also links provided after each topic that will take you to resources for review and practice if you need it.

Accelerated Math is fast paced and you are expected to have good work habits, strive for understanding, and keep up with your work in class. Your teachers are here to help you and also expect that sometimes you may need extra help. You are expected to be able to self-advocate when that happens. That means you will seek out extra help when you are stuck. You can do that by talking to your parents or guardians, using online resources, and also by asking your teachers for assistance. These skills are every bit as important as your math skills in forming a strong foundation for your future success.

Please work through the packet to review and practice the math skills before school starts. If you have any questions this summer, please call Mr. Clausen at Clearwater and he will direct you to a teacher that can help.

Once again, we welcome you to Accelerated Math 8 and look forward to a great year.

Sincerely,

The Administration and Math Teachers of Waconia Middle School

Positive and Negative Integers

Adding and Subtracting Rule	Examples
Two like signs in a row become a **positive sign**	$3+(+2) = 3 + 2 = 5$ $6-(-3) = 6 + 3 = 9$
Two unlike signs in a row become a **negative sign**	$7+(-2) = 7 - 2 = 5$ $8-(+2) = 8 - 2 = 6$

Multiplying and Dividing Rule	Examples
Two like signs become a **positive sign**	$3(2) = 6$ $\frac{16}{8} = 2$ $-6(-3) = 18$ $-125 \div -5 = 25$
Two unlike signs become a **negative sign**	$7(-2) = -14$ $\frac{-90}{5} = -18$ $-81(2) = -162$

Video Resources:

Adding and Subtracting Integers: https://www.youtube.com/watch?v=_BgblvF90UE

Multiplying and Dividing Integers: https://www.youtube.com/watch?v=K_tPbVPfHgk

Positive and Negative Integer Practice Problems

Add.

1. −36 + (−8) _____
2. −10 + 107 _____
3. −52 + 24 _____
4. 18 + (−77) _____

Subtract.

5. −19 − 22 _____
6. −18 − (−25) _____
7. 27 − (−30) _____
8. 35 − 50 _____

Multiply.

9. -10(12) _____
10. (-8)(-8) _____
11. 13(5) _____
12. –25 × –6 _____

Divide.

13. -110 ÷ 10 _____
14. $\frac{48}{2}$ _____
15. 160 ÷ (–8) _____
16. $\frac{-81}{-3}$ _____

Evaluate the Expression

17. −49 + r for $r = -8$
18. −15 + x for $x = 67$
19. y (−16) for $y = -11$
20. w (−17) for $w = 8$

Positive and Negative Rational Numbers

Adding and Subtracting Fractions **Examples**

- Use the common denominator. $\frac{1}{8} + \frac{3}{8} = \frac{1+3}{8} = \frac{4}{8} =$

  $\frac{1}{2}$
- Add or subtract numerators, keep the common denominator constant.
- Write your fraction in simplest form.

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Adding and Subtracting Decimals **Examples**

- Line up the decimal points.

$$\begin{array}{r} 35.78 \\ -14.55 \\ \hline 21.23 \end{array} \qquad \begin{array}{r} 12.83 \\ +24.17 \\ \hline 37.00 \end{array}$$

- Add or subtract right to left as usual.

Multiplying Fractions **Examples**

- Simplify fractions before multiplying
- Multiply the remaining factors in the numerator and the denominator
- The product is positive is the signs are the same, negative if signs are different

Dividing Fractions

- To divide by a fraction, multiply by its reciprocal $\frac{1}{2} \div \frac{3}{5} = \frac{1}{2} \times \frac{5}{3} = \frac{10}{6} = \frac{5}{3}$
- To write the reciprocal of a fraction, switch the numerator and denominator $\frac{-11}{7} \div 4 = \frac{-11}{7} \times \frac{1}{4} = \frac{-11}{4}$

Video Resources:

Adding and Subtracting Fractions: https://www.youtube.com/watch?v=5juto2ze8Lg

Subtracting Decimals: https://www.youtube.com/watch?v=Eq4mVCd-yyo

Multiplying Fractions: https://www.youtube.com/watch?v=qmfXyR7Z6Lk

Dividing Fractions: https://www.youtube.com/watch?v=4lkq3DgvmJo

Positive & Negative Rational Numbers Practice Problems

Add or subtract without a calculator.

1. $\frac{3}{8} - \frac{-1}{8}$
2. $\frac{7}{10} + \frac{4}{15}$
3. $\frac{7}{8} - \frac{11}{12}$
4. $\frac{15}{16} - \frac{5}{32}$

5. 12.1 + 6.75
6. -5.8 – 17.036
7. 17.961 – 7.1
8. 18.01− (−19.26)

Multiply.

9. $\frac{14}{28}\left(\frac{7}{42}\right)$
10. $1\frac{7}{10}\left(-\frac{5}{17}\right)$
11. $-11\left(\frac{5}{22}\right)$
12. $\frac{9}{20}\left(\frac{36}{81}\right)$

Divide.

13. $\frac{10}{15} \div \frac{8}{25}$
14. $1\frac{3}{18} \div 2\frac{1}{3}$
15. $-\frac{6}{13} \div \frac{18}{26}$
16. $-\frac{12}{21} \div -6$

Simplifying Algebraic Expressions

Order of Operations

The order of operations when simplifying an expression is: Parenthesis, Exponents and Radicals, Multiplication and Division Left to Right, Addition and Subtraction Left to Right. **PEMDAS**

Example: $121 \div (17 - 6) \times 3^2 + 10$

$= 121 \div 11 \times 3^2 + 10$

$= 121 \div 11 \times 9 + 10$

$= 11 \times 9 + 10$

$= 99 + 10$

$= 109$

Distributive Property	**Examples**
$A(B + C) = AB + AC$	$12(6 + x) = 72 + 12x$
$A(B - C) = AB - AC$	$10(8 - 2y) = 80 - 20y$

Combining Like Terms	**Examples**
Like terms have the same variable(s) raised to the same power. Find the sum of like terms when simplifying.	$3x + 9 - 2x = x - 9$ $m + 3m^2 - 2m - 6 + 2m^2 = 5m^2 - m - 6$

Video Resources:

Order of Operations: https://www.youtube.com/watch?v=dAgfnK528RA

Distributive Property: https://www.youtube.com/watch?v=ewEorPD4kdA

Simplifying Expression: https://www.youtube.com/watch?v=qe391t3oPWE

Simplifying Algebraic Expressions Practice Problems

Simplify without a calculator.

1. $(-1)^2 - (10 - 13)$ 2. $1 \times (-9 + (-9) + 3^3)$ 3. $-8 - (-3) + 4 \div 2 \times 5$

_____ _____ _____

4. $2m + 3m^2 - 2m + 10 + 2m^2$ 5. $3b - 2a^2b^2 - 2 + a^2 + 2a^2b^2$

6. $x^3 + 2 + 4x^3 - 9 + 3x$ 7. $90 + dg^2 + 4 + 6dg^2 + d^2$

8. $2(2a - 3) + 3$ 9. $7(3 + 2x) + 3x^2 + 5x$

10. $8(y - 5) + 3y$ 11. $3(m^4 + 3mn) - 2$

Solving Equations

To solve equations, first combine like terms (if applicable). Then do the order of operations in reverse, use opposite operations to isolate the variable.

Examples:

Solve 3x – 12 = 9

Add 12 to both sides $3x = 9 + 12$

Divide by 3 $x = 21/3 = 7$

Solve 2x + 10 + 3x = 25

Add like terms 5x + 10 = 25

Subtract 10 on both sides 5x = 15

Divide by 5 x = 15/5 = 3

Solve -3(5y – 10) = y

Use the Distributive property -15y + 30 = 16y

Add 15y to both sides 30 = 16y

Divide both sides by 16 30/16 = y = 1.875

When solving an equation, always check your answer by substituting it into the original equation. If the solution is correct, you get a true equation.

Example 1: 3(7) – 12 = 9; 9=9

Example 2: 2(3) + 10 + 3(3) = 25; 25 = 25

Example 3: -3(5(1.875) – 10) = 1.875; 1.875 = 1.875

Video Resources:

Solving Two-Step Equations: https://www.youtube.com/watch?v=p5e5mf_G3FI

Solving Multi-Step Equations: https://www.youtube.com/watch?v=1c5HY3z4k8M

Solving w/ Distributive Property: https://www.youtube.com/watch?v=YZBStgZGyDY

Solving Equations Practice Problems

Solve.

1. 19x – 12 = 45
2. $\frac{m}{10} - 13 = -20$
3. $1.15a + 8 - 0.4a = -7$

4. $9x - 22 = 23 + 4x$

5. $\frac{2y}{3} + 10 = 12$

6. $8(k + 6) = 3k + 99$

7. $7d + 13 = 35 - 4d$

8. $\frac{2y}{3} - 9 = 2y + 3$

9. $3(6x - 7) - 15x = 3$

Graphing on a Coordinate Plane

Graphing Points

When graphing points, the point is moved right or left the value of the first number and up or down the value of the second.

Examples:

(-3, -9) means 3 left, 9 down

(1,4) means 1 right, up 4

Point A is (4,2)

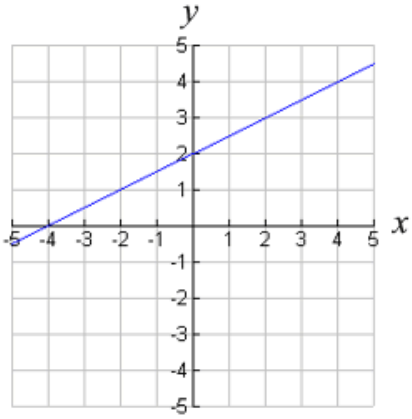
Graphing Lines

Slope-Intercept form: y = mx + b; m=slope, b = y-intercepts

When graphing lines, first identify the y-intercept (the value of y when the line intersects the y-axis). Find the slope between two points (Rise/Run).

Example:

The line graphed has an equation of y = 1/2x + 2

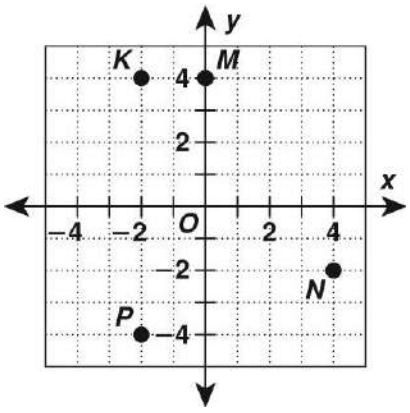


Video Resources:

Graphing Lines in Slope-Intercept Form:
https://www.youtube.com/watch?v=uk7gS3cZVp4

Graphing on a Coordinate Plane Practice Problems

Find the coordinates of the given points:



K. _____

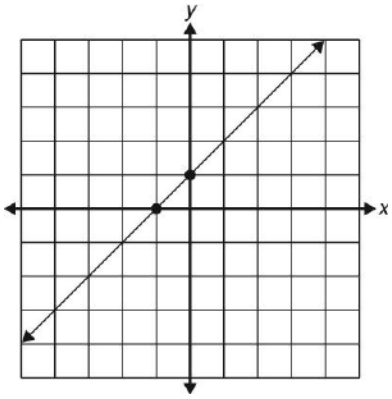
M. _____

N. _____

P. _____

Write the equation of the graphed line in Slope-Intercept form.

1.



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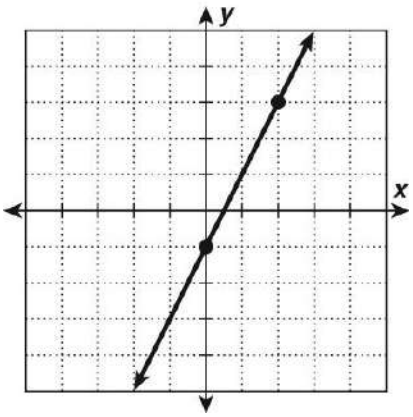
2.



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Least Common Multiple and Greatest Common Factor

Least Common Multiple

The least common multiple (LCM) of two numbers is the smallest number that is a multiple of both.

Examples:

LCM of 3 & 4 is 12 LCM of 3 and 9 is 9 LCM of 12 and 10 is 60

Greatest Common Factor

The greatest common factor (GCF) is the highest number that divides exactly into two or more numbers.

Examples:

6 & 18 have a GCF of 6 24 & 108 have a GCF of 12 3 & 11 have a GCF of 1

Video Resource:

LCM and GCF:
https://learnzillion.com/lessons/2796-find-the-gcf-and-lcm-using-prime-factorization

LCM and GCF Practice Problems

Identify the Least Common Multiple of the given numbers.

1. 9 and 6
2. 12 and 7
3. 14 and 8
4. 6 and 42

Identify the Greatest Common Factor of the given numbers.

5. 9 and 18
6. 12 and 7
7. 14 and 12
8. 14 and 42

Practice Problems Solutions

Positive and Negative Integers

1. -44
2. 97
3. -28
4. -59
5. -41
6. 7
7. 57
8. -15
9. -120
10. 64
11. 65
12. 150
13. -11
14. 24
15. -20
16. 27
17. -57
18. 52
19. 176
20. -136

Positive & Negative Rational Numbers

1. ½
2. 29/30
3. -1/24
4. 25/32
5. 18.85
6. -22.836
7. 10.861
8. 37.27
9. 1/12
10. -1/2
11. -5/2
12. 1/5
13. 25/12 = 2 1/12
14. ½
15. -2/3
16. 2/21

Simplifying Algebraic Expressions

1. 4
2. 9
3. 5
4. $5m^2 + 10$
5. $a^2 + 3b – 2$
6. $5x^3 + 3x – 7$
7. $7dg^2 + d^2 + 94$
8. $4a – 3$
9. $3x^2 + 19x + 21$
10. $11y – 40$
11. $3m^4 + 9mn – 2$

Solving Equations

1. 3
2. -70
3. -20
4. 9
5. 3
6. 10.2
7. 2
8. -9
9. 8

Graphing on a Coordinate Plane

K. (-2,4)

M. (0,4)

N. (4,-2)

P. (-2,-4)

1. $y = 1x + 1$ or $y = x + 1$

2. $y = 2x – 1$

LCM and GCF

1. 18
2. 84
3. 56
4. 42
5. 9
6. 1
7. 2
8. 14