Dear Rising 9th Graders taking Accelerated Algebra/Geometry A,

Congratulations and welcome to the Accelerated Math program at Westlake High School. This is a fast-paced, college preparatory math course. It emphasizes more complex applications and challenging exercises than might be encountered in the traditional high school course. Your success in this class will be the result of the consistency of your study and homework habits. You are a student whose job and responsibility is to be the best student that you can be!

During the semester, we will be learning many new concepts in Accelerated Algebra. Because of the pace and rigor of the course, there will not be a lot of time to spend reviewing topics that you were exposed to in previous math courses. This packet is a review of those topics and courses.

I hope you have a great summer. Since it would be in your best interest to review some mathematics this summer in preparation for this challenging and fun class, I’m providing review problems for you to complete before the first day of school. All topics and concepts in the summer packet are prerequisite knowledge for Accelerated Algebra/Geometry A and were taught in previous math classes. We expect our students to have a strong grasp of linear equations, a solid foundation on geometric concepts, a grasp of basic conversions, recall of perfect squares 1 – 25 and cubes 1 – 10, and a basic understanding of radicals and exponents. If you need a refresher on any of the topics in this review, please look at the resources listed at the end of this packet. Start your year off on the right track by completing these problems before school starts! This packet will be due on the first day of school. For all review problems, make sure that you are completing your work in a neat and organized manner: If you lose this summer packet, you may go to the Magnet Program web page and print a new copy.

1) Show ALL work on notebook paper.
2) Label each section and number each problem.
3) Circle your final answers.

We look forward to seeing you in August!

Sincerely,
Mrs. Whatley

e-mail whatleya@fultonschools.org

Key Concepts that you must know:

1) How to solve multi-step equations (three or more steps, with fractions)
2) How to solve multi-step inequalities (three or more steps, with fractions)
3) How to solve systems of equations by graphing, substitution, and elimination
4) Understand and know all the ins/outs of linear functions (slope: different ways to find and what it means, y intercepts and all the ways to find and what it means in the real world, and how to graph)

Directions
Complete all problems neatly and completely on another sheet of paper in the order in which they appear in the packet. Number each problem and circle your solutions. Credit will only be given if ALL WORK IS SHOWN AND TURNED IN. Make note of any questions you may have as you work through the problems. You can use a calculator.

A. Vocabulary – Define or explain the following terms and provide an example for each.

- Variable
- Function
- Rate of change
- Pythagorean Theorem
- Hypotenuse
- Parallel lines
- Slope
- Transversal
- Complementary angles
- Corresponding angles
- Alternate interior angles
- Alternate exterior angles
- Same-side interior angles
- Vertical angles
**B. Expression - Evaluate the algebraic expressions for #’s 1 - 3 below**

1. \( n^2 - 25 \)  
   a) when \( n = -10 \)  
   b) when \( n = -5 \)  
   c) when \( n = 1/2 \)  
   d) when \( n = 9 \) 

2. \( \frac{-7d + 14}{2} \)  
   a) when \( d = 2 \)  
   b) when \( d = -2 \)  
   c) when \( d = 6/7 \)  
   d) when \( d = 4 \) 

3. Write an algebraic expression for the situation. Define the variable, then evaluate the expression for the amount given. Andrea wants to buy a photo book from an online photo printing service. The book costs $14.98 plus $0.39 for each photo printed in the book. How much will she pay if she wants to have 35 photos in the book?

**C. Integer Operations and Evaluating Expressions**

1. \( r + |4 - p| + p \), where \( p = -3 \) and \( r = -6 \)  
2. \( x + z(y - x) - 10 \), where \( x = -7 \), \( y = -10 \), and \( z = 5 \)  
3. \( \frac{y - (z + z + y)}{2} \), where \( y = 5 \) and \( z = -5 \)  
4. \( (m + q)^2 - \frac{q}{4} \), where \( m = -9 \) and \( q = 8 \) 

**D. Linear Equations and Inequalities**

Find the slope and y-intercept of the line for each equation.

1. \( y = -3x + 4 \)  
2. \( y = \frac{5}{4}x + \frac{6}{11} \)  
3. \( 8x - 4y = 15 \)

Write an equation in slope-intercept form, \( y = mx + b \), for the line with the given information.

4. Slope of \(-8\) and y-intercept of \((0, 12)\)  
5. Slope of \(\frac{6}{11}\) and contains \((0, -3)\) 

Find the x- and y-intercepts for each given line.

6. \( 2x - 5y = 20 \)  
7. \( x + 4y = 8 \)

Find the slope for each given line.

8. Line through \((2,5)\) and \((-3, 17)\)  
9. \( y = 4 \)  
10. Line through \((12, 5)\) and \((12, 65)\) 

Write the equation in slope intercept form for each given line.

11. Line through \((2,1)\) and \((-1, -8)\)  
12. Line through \((3, 1)\) and \((3, 19)\)  
13. Slope of \(\frac{-2}{3}\) through \((5, -1)\) 

Graph the following equations and give the slope. Label and (if not using graph paper) mark axis.

14. \( x = -4 \)  
15. \( y = 2 \)  
16. \( 2x - y = 5 \)  
17. \( y - 1 = \frac{-\frac{1}{2}}{2}(x + 3) \)

Solve the following equations and inequalities showing all work.

18. \( \frac{1}{2}(x - 5) + 1 = 2x + 4 \)  
19. \( 3 - x > -3 \)  
20. \( -\frac{3}{4}x = 12 \)

21. \( -2 = 8 - \frac{x}{5} \)  
22. \( -1 + \frac{x}{4} = 3 + \frac{2x}{5} \)  
23. \( 4 - (5x - 6) \leq 18 - 3x \)

24. \( -6x + 24 = 4x - 15(x - 3) \)  
25. \( 4(x - 3) + 12 = -(x - 3) \)  
26. \((15x + 2)(-2) = x + 4 \)
E. Solving Systems
Choose the best method, then solve the following systems.

1. \[
\begin{align*}
y &= 2x + 9 \\
3x + 2y &= 12
\end{align*}
\]
2. \[
\begin{align*}
7x + 3y &= 25 \\
2x - 4y &= 12
\end{align*}
\]
3. \[
\begin{align*}
5x - 2y &= 10 \\
4y + 20 &= 10x
\end{align*}
\]

F. Algebra (You MUST know all the perfect squares from 1 – 25 and cubes 1 – 10)
Write each radical expression in simplest form:

1. a) \(\sqrt{64}\)  
   b) \(\sqrt{400}\)  
   c) \(\sqrt{196}\)

   Between what two integers is:

2. a) \(\sqrt{27}\)  
   b) \(\sqrt{150}\)  
   c) \(\sqrt{500}\)

3. Identify the parts of the expression \(5x^4\) as either base coefficient or exponent.

4. Simplify each expression
   a) \((4^2b)(2x^3y)^0\)  
   b) \((2x)^{-3}\)  
   c) \(a^{-3}b^2\)  
   d) \(\frac{1}{2x^{-5}}\)

G. Describing Relations - Answer the questions about the graph below that represents a dieter's weight loss over a year's period.

   a) Describe what happens between months 3 and 5.

   b) Sketch a copy of the graph, circle where the graph increases and interpret the meaning.

   c) During which months did the dieter loose the weight the fastest? Explain how you know.
H. Pythagorean Theorem. Find the missing side.

![Pythagorean Theorem Diagram]

4. How far up a wall will an 11 meter ladder reach if the foot of the ladder must be 4 meters from the base of the wall? Draw a picture and solve.

5. What is the diagonal length of a TV Screen whose dimensions are 80 x 60? Draw a picture and solve.

I. Geometry

1. If \( m // n \) and \( n // o \) and \( p \) is a transversal, find the following:

![Geometry Diagram]

a) State a pair of corresponding angles

b) State a pair of alternate interior angles

c) State a pair of alternate exterior angles

d) State a pair of same-side-interior angles

e) State a pair of vertical angles

f) State a pair of supplementary angles.

2. What is the measure of angle L?

3. What is the measure of angle M?

4. What is the measure of angle S?

5. If the measure of angle J is 2x, what is x?

Resources: If you need a refresher on any of these topics, we recommend visiting https://www.khanacademy.org/math/cc-eighth-grade-math. Additional sites below address specific areas.


Radicals: http://regentsprep.org/Regents/math/ALGEBRA/AO1/Laddsubt.htm


Linear equations: http://www.coolmath.com/algebra/08-lines/06-finding-slope-line-given-two-points-01.htm

Parallel Lines and Transversals: http://www.studyzone.org/mtestprep/math8/g/8parallelanglepairsl.cfm

Pythagorean Theorem: http://www.mathsisfun.com/pythagoras.html