

May 2019

Dear Accelerated GSE Geometry B / Algebra II Student:

Congratulations for being placed in the Accelerated GSE Geometry B / Algebra II class for the 2019-2020 school year!

This is a fast-paced and rigorous college-preparatory math course that includes substantial work with the skills and concepts presented in each lesson. The course emphasizes more complex applications and challenging exercises than students might be exposed to in the traditional high school Algebra and Geometry courses. You will be required to think, to apply what you know in new and different situations, and to use problem-solving skills. The course is one in which the concepts from the beginning lessons build upon one another and are essential to the mastery of the material that will be encountered later in the semester. In order to be successful, you must have strong foundational math skills and be consistent with your homework and study habits. It is our hope that you will not only learn the major concepts of this course but that you will also become more independent in your learning and study habits, skills that you will need to be successful in future honors-level and AP courses. It is your responsibility to be the best student you can be!

Because of the pace of our curriculum, we will not be able to spend time in class reviewing skills that were presented in the pre-requisite courses. This packet represents a brief review of some of those topics that will be an important foundation for this course. Work all of the problems neatly on separate paper, **numbering** your work. You **must show work** for each problem, not just an answer. The completed packet is due to Ms. Alexander-VanEaton on Monday, August 5, 2019. These review problems will help me to determine how prepared you are for this course. This packet and subsequent quiz will also represent your first graded assignment for the miscellaneous category in the gradebook. Your work will be graded for completeness and accuracy.

Please feel free to e-mail me at Pamela.Alexander-VanEaton@cobbk12.org if you have any questions. Also join my Remind. Text acgeobalg2 to 71010.

Thank you,
Ms. Alexander-VanEaton
Mathematics Department
Wheeler High School

Accelerated GSE Geometry B / Algebra II
Pre-Requisite Skills Review

Part 1: Relationships Between Quantities

1. The tension caused by a wave moving along a string is found using the formula $T = \frac{mv^2}{L}$. If m is the mass of the string in grams, L is the length of the string in centimeters, and v is the velocity of the wave in centimeters per second, what is the unit of the tension of the string, T ?
2. Isolate the variable v in the formula given in #1 above.
3. Write the expression for the area of a rectangle if its width is 6 units less than its length.
4. Maggie ran at a rate of 13 km/h. Convert her speed to meters per minute.
5. The ratio of students to faculty members in a high school is 23:5. If there are 80 faculty members, how many students are there?
6. The area of a rectangle is 15 cm^2 . Every dimension is multiplied by a scale factor and the new area is 3.75 cm^2 . What was the scale factor?
7. A tree casts a shadow 8.5 ft long at the same time that a nearby 3-foot-tall pole casts a shadow 3.75 feet long. Write and solve a proportion to find the height of the tree.

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Part 2: Reasoning with Equations and Inequalities

8. Will owns a business that produces widgets. He must bring in more in revenue than he pays out in costs in order to turn a profit. It costs \$10 in labor and materials to make each of his widgets. His rent each month for his factory is \$4000. He sells each widget for \$25. How many widgets does Bruce need to sell each month to make the minimum profit?
9. The average of Angie's three test scores must be greater than 70 for her to pass the class. She got a 76 on the last test. She received the same score on her first and second tests. If Angie did end up passing the class, then what score could she have gotten on the first two tests?

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Part 3: Linear and Exponential Functions

10. A certain population of bacteria has a growth rate of 0.02 bacteria/hour. The formula for the growth of the bacteria's population is $A = P_0(2.71828)^{0.02t}$ where P_0 is the original population and t is the time in hours. If you begin with 200 bacteria, approximately how many of the bacteria can you expect after 100 hours?
11. What is the average rate of change over the interval $[1, 3]$ for each equation? What type of model is represented by each set of data?
Equation A: $\{(1,5), (2,25), (3,125), (4,625)\}$
Equation B: $f(x) = 5x - 12$

Find the average rate of change of each function on the given interval:

12. $f(x) = \frac{3}{8}x + 6$, for $-3 \leq x \leq 16$
 13. $f(x) = -4(2)^{x-3} + 7$, for $2 \leq x \leq 8$
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Part 4: Linear Equations

For #s 24-34, solve each linear equation/inequality

14. $\frac{3}{4}x + 6 = \frac{3}{2}$

15. $-x + 5 > -4$

16. $\frac{1}{2}x + \frac{9}{4} \geq \frac{3}{4}$

17. $3(6 - 9x) = -9(3x - 2)$

18. $8x - 5 + 2x \geq 5 + 5x - 12$

19. $\frac{5}{6}x - \frac{1}{3} = x - \frac{3}{2}$

20. $9(x + 1) - 3x = 2(3x + 1) - 4$

Part 5: Quadratic Functions

Solve by factoring:

21. $x^2 + 28x + 195 = 0$

22. $14x^2 - 7x - 21 = 0$

23. $3x^2 - x = 14$

Solve using the quadratic formula:

24. $-2x^2 + 3x + 2 = 0$

Solve by completing the square:

25. $x^2 + 4x = 3$

26. $5x^2 + 6x = 8$

Write the quadratic equation in vertex form. Identify the vertex and the axis of symmetry.

27. $y = x^2 + 6x + 14$

28. $y = -5x^2 + 10x + 3$

Part 6: Similarity, Congruence, and Proofs

29. Two congruent triangles have the following corresponding congruent parts: $\overline{RS} \cong \overline{UV}$, $\overline{RT} \cong \overline{UW}$, and $\angle R \cong \angle U$. Write a congruence statement for the two triangles.

30. $ABCD$ is a parallelogram and the diagonals meet at E . Given that $AE = 8y - 4$, $CE = 5y + 2$, $DE = 8x - 7$, $BE = 5x + 2$, $AB = 2x + 3y$, and $BC = 2x + 5y$, what is the perimeter of $ABCD$?

31. Given that $m\angle P = m\angle R = 27^\circ$, determine the measure of $\angle RST$.

32. Given: D is the centroid of $\triangle PAL$

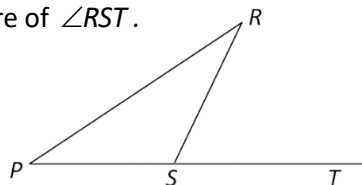
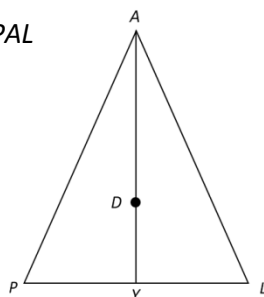
$\overline{AY} \perp \overline{PL}$

$PA = 15x - 37$

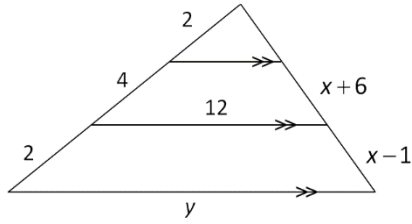
$LA = 8x + 12$

$DY = 3x - 1$

Find the length of \overline{AY}



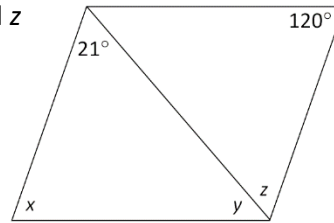
33. Solve for x and y :



34. Given: $\triangle MAR \sim \triangle TIN$
 $m\angle M = 66^\circ$
 $m\angle T = (4x + 3y)^\circ$
 $m\angle N = 27^\circ$
 $m\angle A = (5x + 4y)^\circ$

Solve for x and y

35. In the parallelogram to the right, determine the values of x , y , and z

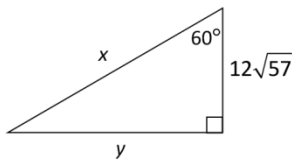


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Part 7: Right Triangle Trigonometry

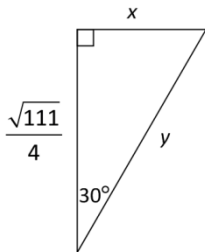
36. Find the perimeter of an equilateral triangle whose altitude is $7\sqrt{2}$ meters.

37. A square has an area of 1058 feet². Find the length of one of the diagonals.

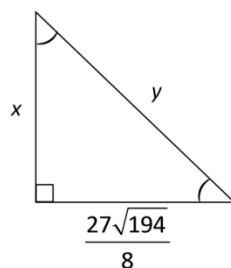
38. Find the exact value of x and y :



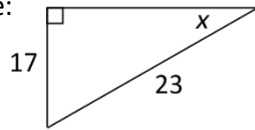
39. Find the exact value of x and y :



40. Find the exact value of x and y :



41. Solve the right triangle:



42. A 25 foot ladder leans against a building. The angle of elevation of the ladder to the building is 70° . How high is the top of the ladder on the building?