SUMMER WORK 2019 **Name: _____**

SUMMER WORK is due at the beginning of class on the FIRST DAY OF SCHOOL. It will be graded!

Welcome to **GSE Accelerated Geometry B/Algebra II** at Whitewater High School.

We are excited about the upcoming year! In order for us to hit the ground running, we need to ask you to spend some time this summer reviewing math content. GSE Accelerated Geometry B/Algebra II is a course 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. Your success in class will be the result of the consistency of your study and homework habits. Reviewing class notes each night and diligent homework efforts will greatly enhance your learning process. You are a student whose job and responsibility is to be the best student that you can be!

All material in this summer packet is prerequisite material for this course. If you encounter material you are unfamiliar with as you complete this packet, it is our expectation that you will look for resources online to help you relearn the material. You can also reach out to us through e-mail throughout the summer for help. You can also find additional resources on Blackboard in our online classroom. Be sure to log-in to Blackboard frequently throughout the summer to check for announcements and additional resources and to become accustomed to using this platform. We will use Blackboard on a daily basis during the school year.

During the first semester, we will be learning many new concepts in the course as well as preparing for the End of Course Milestone in **December**. 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 GSE Accelerated Algebra I/Geometry A or previous math courses. **When completing this packet, please be sure to show your work. ALL WORK and solutions should be completed on separate paper (NOT THIS PACKET), and they should be organized in order.** Be sure to make note of the problems that you have difficulty solving. *We will collect these problems on the first day of school and* ***you will be assessed over this material within the first week of school***.

Start your year off on the right track by completing these problems before school begins. In order to have a successful start to the semester, **DO NOT WAIT UNTIL THE LAST MINUTE** to complete this packet. As you complete this packet, you may want to use a calculator **but no photo math ;)**. We will be using four function, scientific and graphing calculators in GSE Accelerated Geometry B/Algebra II. If you are looking to purchase a graphing calculator, we recommend a TI-84 Plus.

We are looking forward to working with each of you next year. Please feel free to contact Ms. Ellis (ellis.ashley@mail.fcboe.org) or Mrs. Mullen (mullen.jacqueline@mail.fcboe.org) if you have any questions or concerns.

See you in August!

Ms. Ellis and Mrs. Mullen

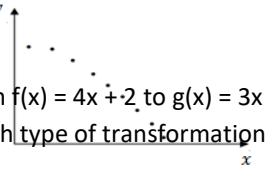
GSE Accelerated Geometry B/Algebra II Teachers

1. If $\angle A$ and $\angle B$ are supplementary, and $m\angle A = 57^\circ$, what is the m $\angle B$?

2. Use the 2-way table to answer the questions below:
   a) What **percent** of students have a low interest?
   b) **Given** a student is male, what is the probability they chose medium?

Interest in Math	Males	Females	Totals
High	7	13	
Medium		10	**20**
Low	5	5	**10**
Totals	**22**		**50**

3. Which situation best fits the graph below and what type of correlation is it?
   a. distance traveled vs. cost of gas; negative correlation
   b. distance traveled vs. cost of gas; positive correlation
   c. time traveled vs. distance from destination; negative correlation



4. The change from f(x) = 4x + 2 to g(x) = 3x + 2 is an example of which type of transformation?

   a. rotation
   b. reflection
   c. translation up
   d. translation down

5. Which of the following is NOT equivalent to: $\left(\frac{x^2y}{4x^5}\right)^{-2}$?

a. $\left(\frac{y}{4x^3}\right)^{-2}$ c. $\left(\frac{16x^5}{y^2}\right)$

b. $\left(\frac{4x^3}{y}\right)^{2}$ d. $\left(\frac{4x^5}{x^2y}\right)^{2}$

6. A research biologist starts with 100 bacteria and watches it double in number each day. Which equation will give the number of bacteria as a function of x, the number of days?

a. $y = 2^x$ b. $y = 100^x$ c. $y = 2(100)^x$ d. $y = 100(2)^x$

7. A trading card increases in value by 2% each year. In 2005, it was worth $8. About how much is it worth in 2011?

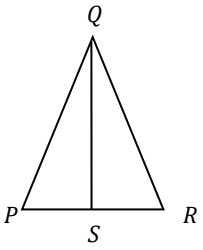
8. If a rectangular pool table measures 4 feet by 8 feet, what is the length from the back edge of the top left pocket to the bottom right pocket to the nearest tenth?

9. The ratio of the measures of two supplementary angles is 8:4. What is the measure of the smaller angle?

10. Two of the three angle measures in a triangle are given. Which are angle measures of an acute triangle?

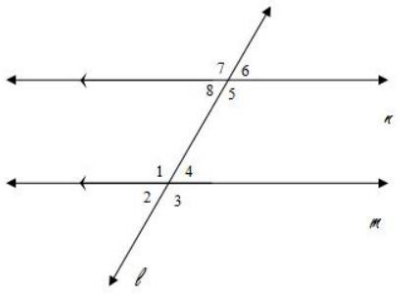
a. 11°, 79° b. 11°, 59° c. 11°, 89° d. 11°, 29°

11. In the figure, why is $\overline{QS} \cong \overline{QS}$?



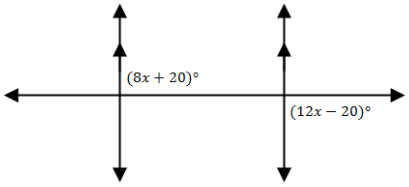
a. all altitudes are congruent
b. Symmetric Property of Congruence
c. Reflexive Property of Congruence
d. Transitive Property of Congruence

12. Which names a pair of corresponding angles?



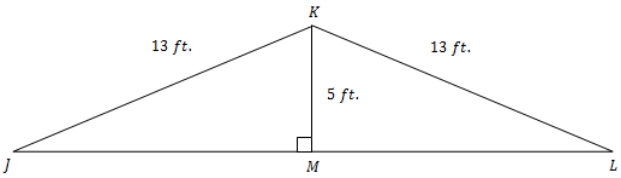
a. $\angle 1$ and $\angle 8$ c. $\angle 2$ and $\angle 7$
b. $\angle 3$ and $\angle 4$ d. $\angle 4$ and $\angle 6$

13. What is the value of 12x - 20?



14. To the nearest tenth, what is the altitude of an equilateral triangle whose sides measure 43 centimeters?

The figure represents the wooden truss used to support the roof of a garage. Use the figure for exercises 15 and 16.



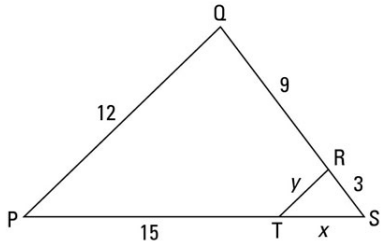
15. What postulate or theorem proves $\Delta JKM \cong \Delta LKM$?

a. SSA b. SAS c. ASA d. HL

16. According to CPCTC, if $\overline{ML} = 12$ feet, how wide is the garage and write what CPCTC represents.

17. Given: $\overline{PQ} \parallel \overline{TR}$

Find: x and y

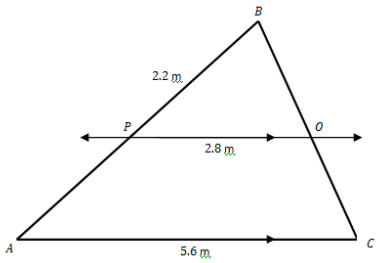


18. Which polygon has line symmetry but not rotational symmetry?

a. rectangle b. square c. rhombus d. kite

19. Which CANNOT be used to prove that a quadrilateral is a parallelogram?
   a. One pair of opposite sides are parallel.
   b. Both pairs of opposite sides are parallel.
   c. Both pairs of opposite sides are congruent.
   d. One pair of opposite sides is both parallel and congruent.

20. To the nearest tenth, what is *AP*?



21. $\overline{MN}$ with endpoints *M(9, 3)* and *N (-1, 5)* is dilated by a scale factor of 2.5. To the nearest tenth, what is the length of $\overline{M'N'}$.

22. The legs of a right triangle measure 11.4 meters and 15.1 meters. To the nearest tenth, which could be the measure of the smallest angle?

23. When the angle of elevation to the sun is 26 degrees, a flagpole casts a shadow that is 82 feet long. What is the height of the flagpole to the nearest foot?

24. Given that $\cos 83^{o} \approx 0.122$, write the sine of a complimentary angle?

25. A circular pizza with a diameter of 15 inches is cut into 8 equal slices. What is the area of one slice?

26. Describe the transformations to the parent graphs:
   a. Describe the transformation to $y = x^2$ if $y = 2(x+4)^2 - 5$

   b. Describe the transformation to $y = x^2$ if $y = (-1/2x)^2$

   c. Describe the transformation to $y = 2^x$ if $y = -2^x - 1$

   d. Describe the transformation to $y = ½^x$ if $y = ½^{-x-3}$

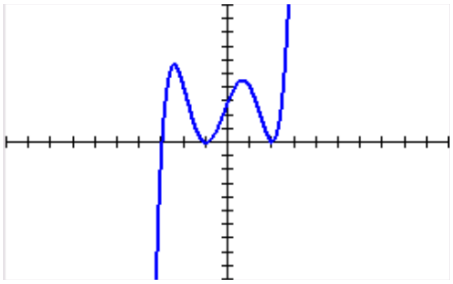
27. Describe the symmetry of the following algebraically. State if the functions are odd, even, neither:
   a. $y = x^3$
   b. $y = 3x^2 + 1$
   c. $y = ½(x-1)^2$

28. Find the average rate of change of $f(x) = 5x^2 - x + 4$ from:
   a. [0, 1] and b. x = 1 to x = 2.

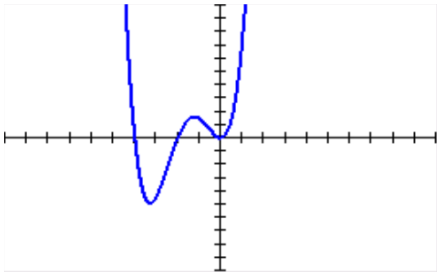
Characteristics of Functions – For the following functions given in #'s 29 - 31, state the following:

   a. Domain and Range
   b. Zeros
   c. Intercepts
   d. Intervals of increase and decrease
   e. Extrema (max and min values)
   f. End behavior
   g. Positive and negative intervals

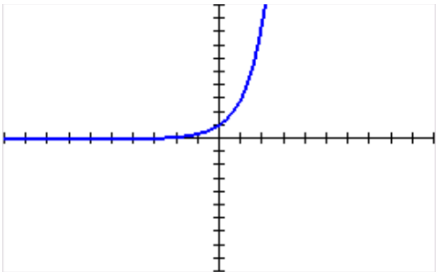
29.



30.



31.



32. Simplify the following **without** using a calculator.

a. $(\sqrt{3})(1+\sqrt{12})$ b. $\sqrt{48x^8}$ c. $\sqrt{\frac{2}{18}}$ d. $\sqrt{12} * \sqrt{15}$

e. $3\sqrt{7} - 4\sqrt{11} + \sqrt{28} - 3\sqrt{44}$ f. $-5\sqrt{2} + 4\sqrt{50}$

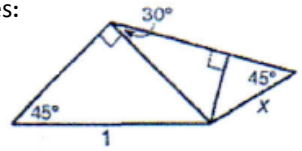
33. Simplify each expression, assuming that no variable equals zero. Write your answer using positive exponents.

a. x^5x^{-11} b. $(p^{-4})^2$ c. 25^0 d. $\frac{y^{-7}}{y^{-3}}$

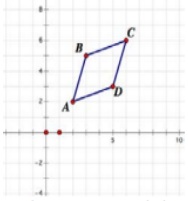
e. $\left(\frac{3x^{-1}y^4}{5x^5y^{-2}}\right)^3$ f. $(7x^3)^2(-x^{-2})^{-5}$

34. In the following triangles, find all missing side and angle measures:

a.



Martin and Simone were given quadrilateral ABCD on a coordinate plane:

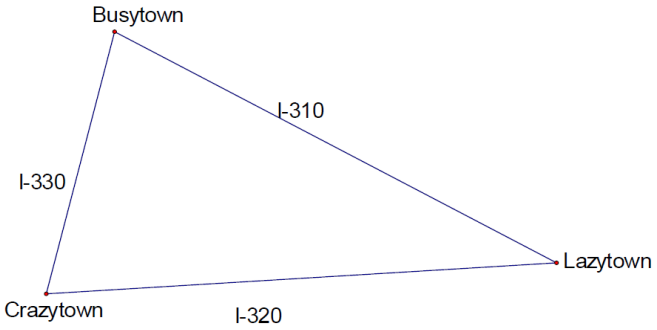


Martin said: "Quadrilateral ABCD is a rhombus because AB||DC and AD||BC and it doesn't have any right angles."

Simone said: "Quadrilateral ABCD is a rhombus because it has two pairs of parallel sides and AB=BC=CD=DA."

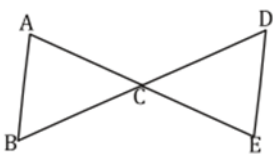
Whose argument is better? Why? Can you write a more precise mathematical argument than Martin and Simone?

36. A developer plans to build an amusement park but wants to locate it within easy access of the three largest towns in the area as shown on the map below. The developer has to decide on the best location and is working with the ABC Construction Company to minimize costs wherever possible. No matter where the amusement park is located, roads will have to be built for access directly to the towns or to the existing highways.



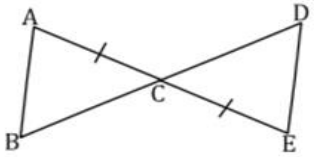
Choose the location that you think will be best for building the amusement park. Explain your thinking using mathematical constructions such as perpendicular bisectors, medians, angle bisectors, and/or altitudes.

37. Given: $\overline{AE}$ Bisects $\overline{BD}$, $\angle B \cong \angle D$



Prove: $\triangle ABC \cong \triangle DBC$

38. Given $\overline{AB} \parallel \overline{ED}$, $\overline{AC} \cong \overline{EC}$



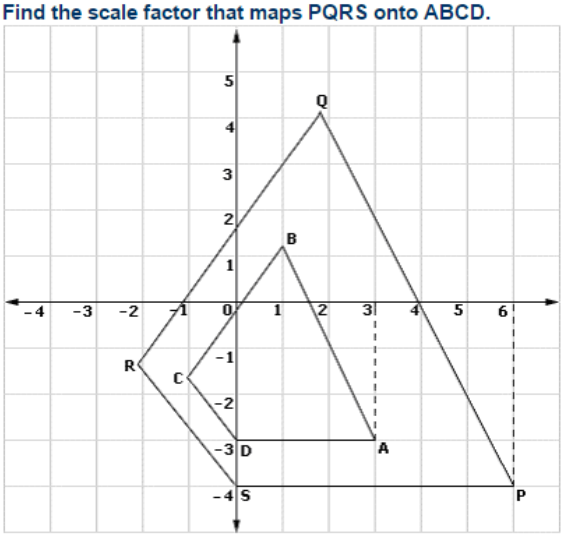
Prove: $\triangle ABC \cong \triangle EDC$

Statements	Reasons

39.

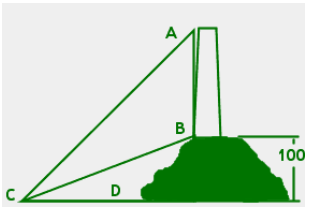
40. Find the scale factor that maps PQRS onto ABCD.

a)



b) What is the center of dilation?

41. A lighthouse stands on a hill 100 m above sea level. If $\angle ACD$ measures 60° and $\angle BCD$ is 30°, find the height of the lighthouse.

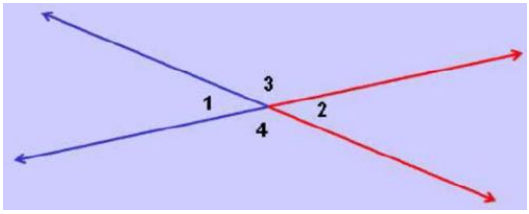


42. An observer in a 50-foot tall lighthouse spots a ship in distress at an angle of depression of 10.5°. How far is the ship from shore?

43. Explain how the difference in rigid and non-rigid motions and affect triangle similarity.

44. Describe the Side-Splitting Theorem.

45. Describe a transformation to map
S (-2, -2), T (-5, -6), U (-6, -6), V (-6, -5) onto its image
S'(-2,2), T' (-6, 5), U' (-6, 6), V' (-5, 6).

46. 

Fill in the blanks to complete the proof that
$\angle 1 \cong \angle 2$
$m\angle 1 + m\angle 3 =$ ____° because the _____
_____ postulate
$m\angle 2 + m\angle 3 =$ ____° because the _____
_____ postulate
Use _____ and set the two equations equal to each other
$m\angle 2 + m\angle 3 = m\angle 1 + m\angle 3$
$-m\angle 3 \qquad -m\angle 3$
So _____
Therefore: ____ ≅____

47. Write the standard form equation for the quadratic function $y = (2x - 7)^2$

48. State the range of the equation $f(x) = x^2 - 2x - 6$.

49. Determine whether $16x^2 - 24x + 9$ is a perfect square trinomial. If so, factor it. If not, explain why.

50. Identify the discriminant and zeros of the function w/out a calculator. $f(x) = 3x^2 - 26x + 16$

51. Identify the x and y intercepts of the function $g(x) = \frac{1}{2}(x - 1)^2 - 6$. (Do NOT write answers with decimals)

52. Convert the equation to **vertex form**: $y = 2x^2 - 8x - 5$

53. Completely factor the following expressions:

a) $4x^2 - 36$

b) $x^4 - 16$

c) $4x^2 - 12x - 16$

d) $25x^2 + 50$

54. The height of in feet of a rocket launched from the ground can be modeled by the function, $h(t) = -16t^2 + 96t$, where t is the time in seconds after it is launched. How long does it take for the rocket to reach its maximum height?