Algebra 2 Honors Summer Assignment   Name:_____

DUE: August 10, 2020

This assignment is for students who have completed Geometry or Geometry Honors and are taking Algebra II Honors in the 2020-2021 school year.

Did you read the instructions? _____

What math are you taking in the 2020-2021 school year? _____

The expectation of the Math Department at Archbishop Hannan High School is that its students become Tenacious Problem Solvers! Thus, as you work on these problems be sure and document your strategies, your mathematical explanations, any drawings, tables or graphs that you use, and the best, complete answer you can find. We hope that you are challenged by these problems and enjoy them. We look forward to the discussion of these problems that we will have in the first weeks of school. Come prepared to defend your solution!

1. Two iron rails, each 50 feet long, are laid end to end with no space between them. During the summer, the heat causes each rail to increase in length by 0.04 percent. Although this is a small increase, the lack of space at the joint makes the joint buckle upward. What distance upward will the joint be forced to rise? [Assume that each rail remains straight, and that the other ends of the rails are anchored.]

2. Give an example of a point that is the same distance from (3,0) as it is from (7,0). Find lots of examples. Describe the configuration of all such points. In particular, how does this configuration relate to the two given points?

3. The two-part diagram below, which shows two different dissections of the same square, was designed to help prove the Pythagorean Theorem. Provide the missing details.
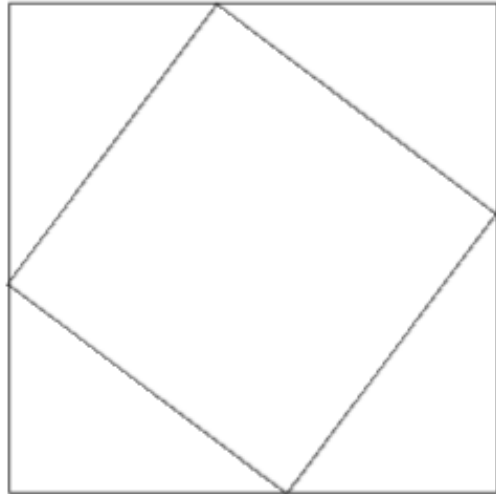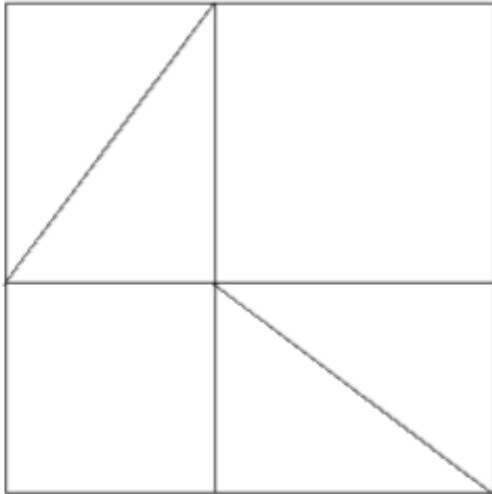

4. Taylor recently purchased two boxes of ten-inch candles—one box from a discount store, and the other from an expensive boutique. It so happens that the inexpensive candles last only three hours each, while the expensive candles last five hours each. One evening, Taylor hosted a dinner party and lighted two candles — one from each box — at 7:30 pm. During dessert, a guest noticed that one candle was twice as long as the other. At what time was this observation made?

5. Compare the two figures shown below. Is there anything wrong with what you see? Be specific and thorough in your analysis of the situation.
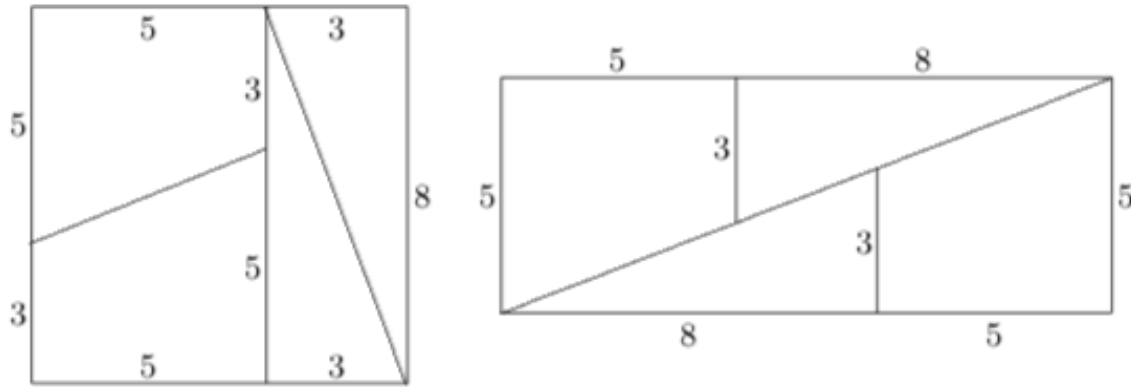

6.
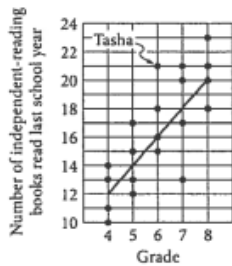
Four students from each of the grade levels 4 through 8 at Wilson School were selected at random and surveyed about the number of books they read. The scatterplot above shows the number of complete independent-reading books, y, that each of the 20 students read during the last school year. A line of best fit for the data is also shown and has the equation $y = 2x + 4$, where x is the grade level of the student.

The mean number of independent-reading books read by the 4 eighth-grade students shown in the scatterplot is the same as the mean number of independent-reading books read by all 62 eighth-grade students in the school last year. In total, how many independent-reading books were read by all eighth-grade students at Wilson School during the last school year?

7.

Size and Sale Price
of Houses in Town H

Size (thousands of square feet)
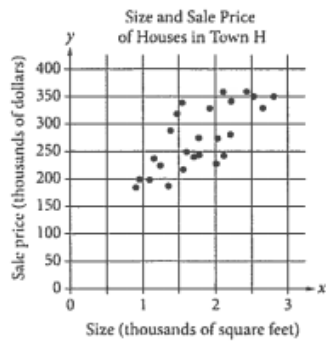
The scatterplot above shows the size x and the sale price y of 25 houses for sale in Town H. Which of the following could be an equation for a line of best fit for the data?

A. $y = 200x + 100$

B. $y = 100x + 100$

C. $y = 50x + 100$

D. $y = 100x$