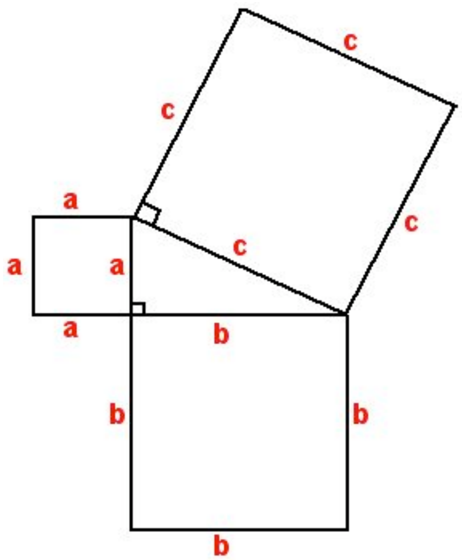
(1) The following problem came from Mike Williams, a 10^{th} grade math student from Salinas, California. It was printed in the December, 1961 issue of Recrational Mathematics Magazine, p. 60.

Mike observed that: "The area between two concentric circles is the same as that of a trapezoid which has the respective circumferences as their parallel bases and an altitude that is the difference between the radii." Can you prove that?

(2) As you know, from Pythagoras, if "a", "b" and "c" are sides of a right triangle, where "c" is the hypotenuse and "a" and "b" are the sides, then $c^2 = a^2 + b^2$. You can draw this as I have below with the actual squares being drawn on each side. Think of the formula as: $\mathbf{c}^{\mathbf{squared}} = \mathbf{a}^{\mathbf{squared}} + \mathbf{b}^{\mathbf{squared}}$



Now, does the same thing apply if you drew equilateral triangles on each side or semi-circles on each side. Are the areas still the same? The "new Pythagoras" formulas would be: $\mathbf{c}^{\mathbf{equilateraled}} = \mathbf{a}^{\mathbf{equilateraled}} + \mathbf{b}^{\mathbf{equilateraled}}$ **and** $\mathbf{c}^{\mathbf{semi\text{-}circled}} = \mathbf{a}^{\mathbf{semi\text{-}circled}} + \mathbf{b}^{\mathbf{semi\text{-}circled}}$.

Proofs will follow next week

(3) Here are a couple more Alphametics. Remember each different letter stands for a different digit from 0 to 9. No number begins with a "0", and no letter can have two different values. When the letters are replaced by the proper digit, each question is a "true" addition problem.

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 MOON             ALLS
  MEN             WELL
  CAN             THAT
-----             ENDS
REACH            -----
                 SWELL
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Answers, next week.