PFS 27-6 12/9/13 _____

Holiday Puzzles!

Warning: Some of these are trick questions!

1) Can you place ten pennies in three empty cups so there is an odd number of pennies in each cup?

2) Place ten pennies in a row. Two players take turns and must remove one or two pennies on each turn. The player who takes the last penny loses. Who has the advantage, first or second player?

3) Put ten pennies in a circle. Each player may take one or two, but if you take two they must be right next to each other (with no penny or open space between them). The player who takes the last penny wins. Who has the advantage, first or second player?

4) Explain the order of these digits: 8, 5, 4, 9, 1, 7, 6, 3, 2, 0.

5) Cross out eleven letters in such a way that the remaining letters spell a single word!

N A I S N I E N L G E L T E T W E O R R S D

6) Four jolly men sat down to play,
And played all night till break of day.
They played for cash and not for fun,
With separate scores for every one.

Yet when they came to square accounts,
They all had made quite fair amounts!
Can you this paradox explain?
If no one lost, how can all gain?

7)

1	8	7	4
2	3	6	5

Take a piece of paper, 4 inches by 8 inches, and divide it into 8 squares and number them (one side only) as shown above. Fold up this map so the 1 is on top and all the numbers are in order below it.

8) There are two big glasses. One contains 8 oz. of water, and the other has 8 oz. of wine. One ounce of wine is added to the water and the mixture is stirred. Now one ounce of the mixture is poured into the wine. Is there now more wine in the water, or more water in the wine? Or are they equal? Explain!

9) A triangle has sides 17, 35, and 52 inches. What is its area in square inches?

10) You walk one mile south, one mile east, and then one mile north, and you're back where you started! How can that be? Where did you start? This classic problem has one classic answer. But guess what! There are many other possible answers! Can you find them?

11) You're in a big science building. In Room 101 there are three switches, marked A, B, and C, with "on" and "off" correctly labeled. In Room 109 there are three light bulbs on a lab table, labeled 1, 2, and 3. Each switch controls one bulb, but you don't know which controls which. You can't see into Room 109 from Room 101. How can you start in Room 101, do whatever you want with the switches, walk into Room 109 only once, and know which switch controls which bulb?

12) Regular star polygons have all sides and angles equal, but the sides are allowed to cross each other. A good way to draw them is to divide a circle into n equal parts, then "connect the dots." There are no star polygons for n = 3 or n = 4. Can you draw some beautiful star polygons? Can you make a set, for example, of all the different star polygons for n = 11? How many different ones are there for each n? Is there a rule? What determines whether the star polygon is all connected, like the five-pointed star, or has parts, like the six-pointed star? Can you relate the star polygons with n = 12 to musical ideas, such as the circle of fifths?

2013) Is 2013 a prime number? If not, what are its factors? What are the factors of 2014? What's the next year that will be a prime number?

2014) Have fun! Happy New Year!