Mixed Team Competition 2008

Instructions: Do as many problems as possible, and write your answers on the answer sheet provided. You may not use a calculator. Be sure to work as a TEAM and Have Fun!

1. A customer took six gold chains, each containing five links, to a jeweler. He wanted the six chains to be joined into one large circular chain. The jeweler replied that she could do the job for a cost of one dollar for every link that is opened and closed. What is the smallest cost that could be charged for this assignment?

2. Ben and Brady each own the same number of footballs. They both agree that after the next time that the Steelers and the Browns play football, the loser of the game should give the winner of the game enough footballs so the winner will have six more footballs than the loser. How many footballs should the loser give to the winner of the next game?

3. Jennie Finch, professional softball player, owns many softball gloves. Someone once asked her how many she had. She replied, “If you add one fourth of the number to one third of the number, you will then have ten more than one half the number.” How many softball gloves does she have?

4. How much is one million divided by one fourth plus fifty?

5. A mathematician once met three students and told them about her car. “What color is your car?” asked one of the students. The mathematician told the students that they could try guessing the color. When she had heard enough of the guesses the plan was to tell the students some things about their guesses. From these comments, the students were supposed to figure out the color of the car. The students made the following three guesses and the mathematician told them to stop.

   (a) The car is not black.
   (b) The car is either brown or gray.
   (c) The car is brown.

The mathematician then stated that at least one of the three students guessed right and at least one of the students guessed wrong. What color is the car?

6. Choose your favorite baseball team and consider the scores it will make next season. Which would you bet will be the larger number - the sum of these scores or the product of these scores? Justify your answer

7. There are two types of players on a soccer team those players who prefer to play during the day and those players who prefer to play at night. On this strange team, the day-players always tell the truth during the day and lie during the night. The night-players always tell the truth during the night and lie during the day. In the following problems, we assume that it never changes from day to night or from night to day during the course of the conversation.

   (a) During a recent interview following a game, one of the players said, “During the daylight hours I claim it is night.” Was the interview conducted during the day or during the night?
(b) On another occasion immediately follow a game, a player states, “During the day I claim that I am a night player, but I am really a day player.”
   i. Is this player a night-player or day-player?
   ii. Is it day or night?

(c) On another occasion immediately following a game, one player stated, “I am a night-player, and it is now day.”
   i. Was he a day-player or a night-player?
   ii. Was the game played during the day or night?

8. Determine which of the three patterns fits into the empty section.

9. A Sudoku puzzle consists of a nine by nine square grid subdivided into nine three by three boxes. Some of the squares contains numbers. The object is to fill in the remaining squares so that every row, every column, and every three by three box contains each of the numbers one through nine exactly once.