

## Some Perplexing Problems (from Edward Zaccaro's book Counterintuitive Problems)

### Warmups:

a) Suppose you are an astronaut who is on a spacewalk. A 100-foot tether is keeping you attached to the space shuttle and the only thing you are carrying is a battery-operated fan. Suddenly, a meteor slices through your tether and you are left stranded 100 feet from the safety of the shuttle. How would you get back to the shuttle?

b) A ball and a glove together cost \$10. If the glove cost \$9 more than the ball, what is the cost of the ball?

c) Some scientists estimate that the universe contains  $10^{87}$  atoms. How many atoms are there in one tenth of the universe?

**Now that you are warmed up!** 😊 (Do at your own pace, I will send answers next week!)

- 1) An eccentric mathematician gives one die to a student and declares that if the student rolls a "4," he will give the student \$1,000,000. To make the student more likely to win the \$1,000,000, the mathematician decides that the student will get three rolls of the die. If any roll is a "4," the money is hers. What is the probability that the student will win \$1,000,000?
- 2) A well-known game show had contestants try to win valuable prizes by picking one of three doors. The game show host knew where the valuable prize was, so after a contestant made her pick, the host would open a door he knew didn't contain the prize and show the contestant what was behind that door. He would then ask the contestant if she wanted to trade her door for the remaining door. What are the chances that the contestant will win if she keeps her original door? What are the chances that she will win if she switches doors?
- 3) Which causes more pressure on a rope?
  - a) Ten 200-pound people on one side of a rope who are pulling with all their might with the other side attached to a tree.
  - b) Ten 200-pound people on one side of a rope with another ten 200-pound people on the other side. Both sides are pulling with all their might.

Have fun with these! The answers will be on next week's page 😊