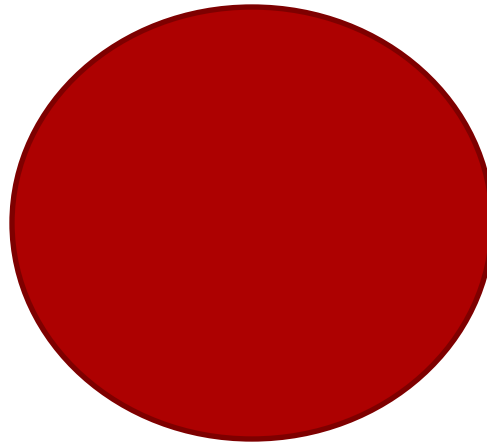


Story 10. Dot of Fortune

Red or White??



One day three college students were selected at random from the studio audience to play the ever-popular TV game show, “Dot of Fortune.” One of the students had already discovered the power and beauty of mathematical thinking, while the other two were not nearly so fortunate. The stage contained no mirrors, reflective surfaces, or television monitors. The three students were seated around a small round table and blindfolded. As Pat, the host, explained the rules of the game, Vanna affixed a conspicuous but small colored dot to each student’s forehead.

“So, contestants,” Pat explained, “at the sound of the bell you will remove your blindfolds. You will see your two companions sitting quietly at the table, each with a dot on his or her forehead. Each dot is either red or white. You cannot, of course, see the dot on your own forehead. After you have observed the dots on your companions’ foreheads, you will raise your hand if you see at least one red dot. If you do not see a red dot, you will keep your hands on the table. The object of the game is to deduce the color of your own dot. As soon as you know the color of your dot, hit the buzzer in front of you. Do you understand the rules of the game?” All the students understood the rules, although the math fan understood them better.

“Are you ready?” asked Vanna after affixing a red dot to each student’s forehead. After the contestants nodded, Vanna rang the bell and they removed their blindfolds. The studio audience quivered with anticipation. The students looked at one another’s dots, and all raised their hands. After some time, the math fan hit her buzzer, knowing what color dot she had. Explain how she knew this. Why did the other students not know? This game requires creative logical reasoning—a powerful means to make discoveries whether they are in math, in life, or even (although rarely) on prime-time TV.

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Nudges:

- Sometimes no action is action enough. Put yourself in the position of one of the three contestants. You know that the dot on your forehead is either red or white.
- The trick to figuring out this conundrum is to imagine what would happen if you were wearing a white dot.
- You are sitting at the table looking at two red dots.

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Nudges:

- What would your two companions be seeing?
- What could they deduce?
- What would they do?
- What did they do?
- What can you conclude?