Activity Sheet for the September, 2009, MATHCOUNTSMini

Warm-Up!

Try these problems before watching the lesson. For all problems, assume the dice are fair six-sided dice numbered from 1 to 6.

1. If one die is rolled, what is the probability that a 3 is rolled?

2. If two dice are rolled, what is the probability the sum of the resulting numbers is 4? What is the probability that the sum of the resulting numbers is 10?

3. If three dice are rolled, what are the possible values of the sum of the numbers rolled?

The Problem

If three standard, six-faced dice are rolled, what is the probability that the sum of the three numbers rolled is 9? Express your answer as a common fraction. *2009 State Sprint Round #14*

Follow-up Problems

4. If two dice are rolled, what is the probability the sum of the resulting numbers is 6?

5. If three dice are rolled, what is probability that the sum of the three numbers rolled is 7?

6. If three dice are rolled, what is the probability that the sum of the three numbers rolled is 14?

7. Do you notice anything interesting about your answers to the previous two problems? If not, then do the problems again. If so, can you explain why the relationship occurs, and use that explanation to find a faster way to solve Problem 6 by just using your answer from Problem 5?

Further Exploration

8. In the video, Richard mentioned that you can use Pascal's Triangle to remember 11^3. Look at Pascal's Triangle—where do you see 11^3? Do you see 11^2? How about 11^4? What's going on here?

9. Richard also mentioned that you might more easily remember 12^3 if you knew about the history of Hardy and Ramanujan. What was he talking about?

Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).