



Math Olympiad and Problem Solving Programs
E130 - Honors Geometry Problem Solving
Problem Set 7.2 - SAT Probability

Name:

Date:

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1. There are 6 ways we can roll a 7 with two dice: (1,6), (2,5), (3,4), (4,3), (5,2), (6,1). There are 5 ways to roll an 8: (2,6), (3,5), (4,4), (5,3), (6,2). There are 4 ways to roll a 9: (3,6), (4,5), (5,4), (6,3). There are 3 ways to roll a 10: (4,6), (5,5), (6,4). There are 2 ways to roll an 11: (5,6), (6,5). There is 1 way to roll a 12: (6,6). So the probability of rolling at least a 7 is $\frac{6 + 5 + 4 + 3 + 2 + 1}{36} = \frac{21}{36} = \frac{7}{12}$. The answer key was wrong. The answer should be E.
2. B
3. D
4. E
5. B
6. A
7. D
8. C
9. We must consider two cases. CASE 1: drawing the red marble from A and the blue from B; CASE 2: drawing the red from B and the blue from A. Let's first consider case 1. The probability of drawing a red from A is $\frac{2}{5}$ and the probability of drawing a blue from B is $\frac{1}{5}$. So the probability of case 1 happening is $\frac{2}{5} \times \frac{1}{5} = \frac{2}{25}$. Now consider case 2. The probability of drawing a red from B is $\frac{4}{5}$ and the probability of drawing a blue from A is $\frac{3}{5}$. The probability of case 2 is $\frac{4}{5} \times \frac{3}{5} = \frac{12}{25}$. Now we add the probabilities for the two cases: $\frac{2}{25} + \frac{12}{25} = \frac{14}{25}$. D
10. The problem implies that we cannot select two of the same number. For instance, we can't select 1 and 1 to make a sum of 2. The minimum sum we can get is $1 + 2 = 3$, and the maximum sum is $5 + 6 = 11$. We can get all the sums in between these two numbers. So we just need to count how many numbers are in the list 3, 4, ..., 11. There are $11 - 3 + 1 = 9$. E