



Math Olympiad and Problem Solving Programs
E230 - Advanced Math Competitions
Problem Set 6.1 - AMC 8 Probability

Name:

Date:

1. **C**. There are six ways to arrange three students. The probability is $\frac{1}{6}$.
2. **E**. If 6 is at the bottom, the product has a factor of 2 and 3. Thus, is divisible by 6. If 6 is not at the bottom, it is also divisible by 6. Thus, the product is always divisible by 6.
3. **B**. Since P is always even and R is always odd, the probability is determined by Q being odd. The probability is $\frac{1}{3}$.
4. **B**. The proportion of blue and green marbles is 1:3. Thus, there are **18** green marbles in the bag.
5. **A**. We can simply list the cases of the products that exceed 36: (5, 8), (6, 7), (6, 8), (7, 6), (7, 7), (7, 8), (8, 5), (8, 8). The probability is $\frac{10}{64} = \frac{5}{32}$.
6. **B**. Since $\frac{2}{5}$ of women are single, $\frac{3}{5}$ of the women are married. The proportion of single:married women:married men is 2 : 3 : 3. Thus, the probability is $\frac{3}{8}$.
7. **B**. The total number of phone numbers is 8×10^6 . The number begin with 9 and end with 0 is $\times 10^5$. The probability is $\frac{10^5}{8 \times 10^6} = \frac{1}{80}$.
8. **C**. The total number of 3-digit numbers is $4!$. The number divisible by 3 is a permutation of the following triples (1, 2, 3), (2, 3, 4). Then the total number is $2 \times 3!$. The probability is $\frac{2 \times 3!}{4!} = \frac{1}{2}$.
9. **A**. WLOG, let the radius of the circle be 2. Then, the area close to the origin will be a circle with radius of 1. The probability is $\frac{\pi 1^2}{\pi 2^2} = \frac{1}{4}$.