

Please write ***Your name:*** _____

You may leave your answer in terms of sums, products, factorials or binomial coefficients, and fractions. There is NO need to simplify. NO calculators are needed.

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- (1) What is the probability that if we roll 2 dice, the sum is 3?

$$\mathbf{Answer:} \quad \frac{2}{36} = \frac{1}{18}$$

- (2) What is the probability that if we roll 2 dice, the sum is 5?

$$\mathbf{Answer:} \quad \frac{4}{36} = \frac{1}{9}$$

- (3) What is the probability that if we roll 3 dice, the sum is 18?

$$\mathbf{Answer:} \quad \frac{1}{6^3} = \frac{1}{216}$$

- (4) If we choose 3 cards out of 52 at random. What is the probability that they are of the same color?

$$\mathbf{Answer:} \quad \frac{\binom{2}{1} \cdot \binom{26}{3}}{\binom{52}{3}}$$

- (5) If we choose 3 cards out of 52 at random. What is the probability that their colors are all different?

$$\mathbf{Answer:} \quad 0$$

- (6) Suppose we choose 6 balls at random from a box containing 9 red and 8 blue balls. What is the probability that, among these 6 balls, 4 are red and 2 are blue?

$$\mathbf{Answer:} \quad \frac{\binom{9}{4} \cdot \binom{8}{2}}{\binom{17}{6}}$$