

Probability

1

- (1) When 2 coins are tossed at the same time, find the probability that 1 coin comes out face up.
- (2) When 2 dice are thrown at the same time, find the probability that the product of the rolls of the dice is 12.

2

When 3 boys and 3 girls line up in a row, find the probability that the boys and girls alternate.

3

Find the probability of drawing exactly 1 winning lottery ticket when 3 lots are drawn at the same time from 10 lots containing 3 winning lots.

4

When 3 people play rock-paper-scissors once, find the probability of a game of rock-paper-scissors.

5

When 1 card is drawn from 50 cards numbered from 1 to 50, find the probability that the number is divisible by 3 or 7.

6

- (1) A 12-piece product contains 3 defective products. Find the probability that 2 of these products contain defective products when they are taken out.
- (2) Find the following probabilities when 3 dice are thrown at the same time.
 - ① Probability that the maximum number of dice rolls that come out is less than or equal to 4
 - ② Probability that the maximum number of dice rolls that will appear is 4

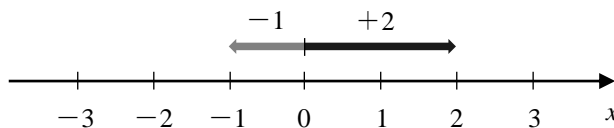
7

Pouch A contains 3 red balls and 5 white balls, and pouch B contains 4 red balls and 2 white balls. When 1 ball is removed from pouch A and 1 ball from pouch B, find the probability that the 2 balls are of different colors.

8

(1) Point P is on the x -axis.

When a dice is thrown and a multiple of 3 is obtained, P moves forward on the x -axis by 2 in the positive direction, and when a dice is not a multiple of 3, P moves forward on the x -axis by 1 in the negative direction.



Find the probability that P starting from the origin is at the point $x=1$ when the dice are thrown 5 times.

(2) 2 teams, A and B, will play a volleyball match. When the winner is the one who wins the first 3 sets, find the

following probabilities. However, assume that the probability of A beating B in 1 set of games is $\frac{2}{3}$ and the

probability of B beating A is $\frac{1}{3}$.

- ① Probability of A winning in the 3rd set
- ② Probability of A winning in the 4th set
- ③ Probability of A winning

(3) When tossing 6 coins, find the probability that there will be 3 fronts and 3 backs.

9

There are 10 lots including 4 winners. When X draws the first lottery ticket and Y draws the next ticket without putting it back, find the probability that Y draws the winning ticket.

10

At a certain supermarket, a 700-yen boxed meal is discounted at 7:00 p.m. with the probabilities shown in the table on the right.

Find the expected value of this boxed meal at 7:00 p.m.

Also, if this boxed meal is sold at 7:00 p.m. at a 20% discount, should I buy it or not?

| discount rate | probability |
|---------------|----------------|
| 50% off | $\frac{1}{10}$ |
| 20% off | $\frac{6}{10}$ |
| no discount | $\frac{3}{10}$ |
| total | 1 |

Study

Two machines A and B are producing the same product. The product of machine A contains 0.3% defective products and the product of machine B contains 0.1% defective products. When 400 products from machine A and 600 products from machine B are extracted and 1 product is taken out after stirring well, find the following probabilities.

- (1) Probability of defective product
- (2) Probability that the defective product is the product of machine A