

Probability

1. Two fair dice are rolled. Find the probability that the sum of the scores exceeds 8. $\frac{5}{18}$
2. Two fair dice are rolled. Find the probability that the product of the scores is less than 15. $\frac{23}{36}$
3. Two fair dice are rolled. Find the probability that the difference between the scores is greater than 3. $\frac{1}{6}$
4. Two fair dice are rolled. Find the probability that the sum of the scores is a prime number. $\frac{5}{12}$
5. Two fair dice are rolled. Find the probability that the difference between the scores is less than 2. $\frac{4}{9}$
6. Two fair dice are rolled. Find the probability that the product is a prime number. $\frac{1}{6}$
7. Two fair dice are rolled. Find the probability that the product is 6. $\frac{1}{9}$
8. Two fair dice are rolled. Find the probability that the larger score divided by the smaller score is greater than 1.5. $\frac{5}{9}$
9. Three fair dice are rolled. Find the probability that sum exceeds 14. $\frac{5}{54}$
10. Four fair dice are rolled. Find the probability that the sum is less than 8. $\frac{35}{1296}$
11. A bias coin lands on heads with probability $\frac{1}{4}$.
 - (a) If the coin is flicked 50 times, how many times would you expect to see tails flicked? 37.5
 - (b) If the coin is flicked six times, find the probability that you get six tails. 0.178 (to 3sf)
 - (c) If the coin is flicked twice, find the probability you get one head and one tail in any order. $\frac{3}{8}$
12. Gerry buys a new suit on Monday with probability $\frac{2}{3}$. In a job interview on Tuesday, if he is wearing the new suit he gets offered the job with probability $\frac{3}{4}$. If he doesn't wear the new suit he gets offered the job with probability $\frac{1}{5}$.
 - (a) Draw a tree diagram of the situation.
 - (b) Find the probability that Gerry gets offered the job. $\frac{17}{30}$
13. Simon argues with his wife in the morning with probability $\frac{1}{12}$. If he argues with his wife in the morning, there is a $\frac{2}{3}$ chance that he shouts at his colleagues. If he doesn't argue with his wife, there is a $\frac{7}{8}$ chance that he doesn't shout at his colleagues. On a given day, find the probability that he shouts at his colleagues.
14. A bag contains 5 yellow beads, 3 red beads and 2 green beads. A bead is taken from the bag and its colour noted. It is *not* replaced in the bag. A second bead is then taken from the bag.
 - (a) Draw a tree diagram of the situation.
 - (b) Find the probability that the two beads are the same colour. $\frac{14}{45}$

(c) Find the probability that the second bead is yellow.

$$\frac{1}{2}$$

15. Now do the question above if the first ball *is* replaced in the bag after its colour noted.

$$\frac{19}{30}, \frac{1}{2}$$

16. A bag contains 3 yellow beads, 4 red beads and 2 green beads. Two beads are taken from the bag at once. Find the probability of at least one green.

$$\frac{5}{12}$$

17. A bag contains 3 yellow beads, 4 red beads and 2 green beads. Three beads are taken from the bag at once. Find the probability of two beads of one colour and one bead of another colour.

$$\frac{55}{84}$$