

Question 1: Counters

A bag contains 4 red, 3 blue, and 5 green counters.

One counter is chosen at random.

- (a) What is the probability it is red?
- (b) What is the probability it is not blue?

Question 2: Dice Roll

A fair six-sided die is rolled.

- (a) Find the probability of getting an even number.
- (b) Find the probability of getting a number greater than 4

Question 3: Spinner

A spinner has 8 equal sections numbered 1–8.

What is the probability of landing on:

- (a) a multiple of 3
- (b) a prime number?

Question 4: Marbles

A bag contains 2 yellow, 6 pink, and 2 black marbles.

Two marbles are drawn *without replacement*.

Find the probability that both are pink.

Question 5: Coin Toss

A coin is flipped twice.

List the sample space and find the probability of getting:

- (a) two heads
- (b) one head.

Question 6: Pens

There are 12 pens in a box: 5 blue, 4 black, and 3 red.

A pen is chosen at random.

Find the probability that it is:

- (a) blue or black
- (b) not red.

Question 7: Spinner with Letters

A fair spinner has equal sections labelled A, A, B, C, D.

- (a) Write down the probability of landing on A.
- (b) Find the probability of not landing on D.

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Question 8: Coloured Balls

A bag has 3 red balls and 2 white balls.

One ball is taken out, replaced, then another is taken.

Find the probability that:

- (a) both balls are red
- (b) one red and one white.

Question 9: Playing Cards

A card is drawn from a standard deck of 52 playing cards.

Find the probability of drawing:

- (a) a heart
- (b) a face card (J, Q, or K).

Question 10: Pizza and Pasta

A survey of 40 students found that 24 like pizza, 18 like pasta, and 10 like both.

If one student is chosen at random, find the probability that the student likes:

- (a) pizza but not pasta
- (b) pizza or pasta.

1.

(a) There are 4 red counters out of 12 in total.

The probability of picking a red counter is $4/12 = 1/3$.

(b) There are 3 blue counters, so 9 counters are not blue.

The probability of not picking a blue counter is $9/12 = 3/4$.

2.

(a) The even numbers on a die are 2, 4, and 6.

The probability of rolling an even number is $3/6 = 1/2$.

(b) The numbers greater than 4 are 5 and 6.

The probability is $2/6 = 1/3$.

3.

(a) Multiples of 3 between 1 and 8 are 3 and 6.

The probability of landing on a multiple of 3 is $2/8 = 1/4$.

(b) The prime numbers between 1 and 8 are 2, 3, 5, and 7.

The probability of landing on a prime number is $4/8 = 1/2$.

4.

There are 10 marbles in total.

The probability of picking one pink first is $6/10$.

Without replacement, there are now 5 pink left out of 9 marbles.

The probability of both pink is $(6/10) \times (5/9) = 30/90 = 1/3$.

5.

The sample space for flipping two coins is: **HH, HT, TH, TT**.

(a) There is 1 outcome with two heads (HH), so probability = $1/4$.

(b) There are 2 outcomes with one head (HT, TH), so probability = $2/4 = 1/2$.

6.

There are 12 pens in total.

(a) Blue or black = $5 + 4 = 9$ pens.

The probability is $9/12 = 3/4$.

(b) There are 3 red pens, so not red = 9 pens.

The probability of not red is also $9/12 = 3/4$.

7.

There are 5 sections on the spinner.

(a) A appears twice, so probability = $2/5$.

(b) Not landing on D means landing on A, B, or C, which together cover 4 sections.

The probability is $4/5$.

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8.

Each draw is independent because the ball is replaced.

(a) Probability of red on one draw = $3/5$.

For two reds: $(3/5) \times (3/5) = 9/25$.

(b) One red and one white can happen in two ways: RW or WR.

So probability = $(3/5 \times 2/5) + (2/5 \times 3/5) = 12/25$.

9.

(a) There are 13 hearts in a deck of 52 cards.

The probability of drawing a heart is $13/52 = 1/4$.

(b) There are 12 face cards (3 per suit $\times$ 4 suits).

The probability of drawing a face card is $12/52 = 3/13$.

10.

Use the formula for probability with overlap.

(a) Pizza but not pasta = $24 - 10 = 14$ students.

The probability is $14/40 = 7/20$.

(b) Pizza or pasta = $24 + 18 - 10 = 32$ students.

The probability is $32/40 = 4/5$.