



Probability

2009

- 4 A bag contains x red balls, y blue balls and z yellow balls. One ball at random is taken out and replaced. A second ball at random is taken out and replaced.

If the balls are identical in all respects except colour and are well mixed, what is the probability that the first ball was red and the second blue?

- A $(x+y)/(x+y+z)^2$
B $xy/(x+y+z)(x+z)$
C $xy/(x+y+z)^2$
D $(x+y)/(x+y+z)$
E $xy/(y+z)(x+z)$



Probability

2011

- 24** I have two six-sided dice, each with faces numbered from 1 to 6. One of the dice is fair, but the other is not – it will land on numbers 1 to 5 with equal probability, but lands on 6 with a different probability.

When I roll the dice the probability that I get a total of 12 is $\frac{1}{18}$.

What is the probability that I get a total of 2 when I roll the dice?

- A** $\frac{1}{72}$
- B** $\frac{1}{45}$
- C** $\frac{1}{36}$
- D** $\frac{1}{18}$
- E** $\frac{1}{9}$



Probability

2012

- 20** In a fairground game there are two bags, each of which contains 4 coloured balls. There are a total of 4 red balls, 3 yellow balls and 1 blue ball. The player chooses one of the bags and removes two balls without replacing them. If the two balls are the same colour then the player wins. The player is equally likely to choose either bag and the balls are arranged to give the smallest possible probability for the player to win.

What is the probability that the player wins?

- A $1/6$
- B $1/4$
- C $9/24$
- D $1/2$
- E $3/4$

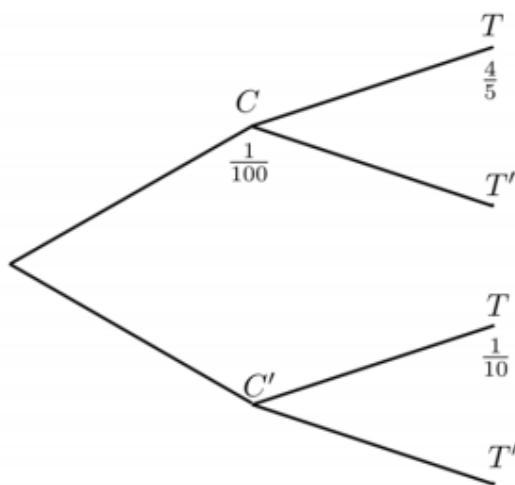


Probability

2014

24 A test is developed to detect a certain medical condition. The test is not perfect, and sometimes gives incorrect results. The behaviour of the test on 1000 randomly selected members of the population is shown in this tree diagram, where the following notation is used:

- C = has the condition
- C' = does not have the condition
- T = tests positive for the condition
- T' = tests negative for the condition



Three of the branches' proportions are shown in the tree diagram:

- $\frac{1}{100}$ of the 1000 people have the condition
- $\frac{4}{5}$ of those with the condition test positive for the condition
- $\frac{1}{10}$ of those without the condition test positive for the condition

A person is selected at random from these 1000 people, and tests positive for the condition.

What is the probability that this person has the condition?



Probability

2015

- 4 A bag contains only 8 beads.

The beads are identical in all respects except colour.
3 of the beads are black and the other 5 beads are white.
A bead is taken at random from the bag and not replaced.
A second bead is then taken at random from the bag.

What is the probability that both beads are black?

- A $\frac{3}{32}$
B $\frac{3}{28}$
C $\frac{9}{64}$
D $\frac{3}{14}$
E $\frac{37}{56}$



Probability

2016

- 24 Some blood is found at a crime scene. The police know that it belongs to the **one** criminal involved.

A person's red blood cells can have type A antigens, type B antigens, both types or neither type.

In a population:

45% of people have type A antigens but not type B

9% of people have type B antigens but not type A

43% of people have neither type of antigen

3% of people have both types of antigen

An antibody test shows that there are type B antigens present in the red blood cells at the crime scene.

What is the probability that the criminal's red blood cells have **both** type A and type B antigens?

A $\frac{3}{100}$

B $\frac{1}{16}$

C $\frac{3}{25}$

D $\frac{1}{4}$

E $\frac{3}{4}$



Probability

2017

- 8 In a group of 20 patients at a medical centre, 5 suffered from migraines.

Two patients from the group of 20 were picked at random for a survey on the use of painkillers.

What is the probability that both of the patients picked suffered from migraines?

- A $\frac{1}{19}$
- B $\frac{1}{16}$
- C $\frac{35}{76}$
- D $\frac{1}{2}$
- E $\frac{21}{38}$
- F $\frac{9}{16}$



Probability

2018

- 8 My wallet contains two 50p coins and five 20p coins only.

I need 70p to buy an item.

If I pick two coins at random from my wallet, what is the probability that I have picked the exact money to buy the item?

- A $\frac{1}{2}$
- B $\frac{5}{21}$
- C $\frac{10}{21}$
- D $\frac{20}{49}$
- E $\frac{25}{441}$
- F $\frac{50}{441}$



Probability

2019

20 To get to work, Sylvie first catches a bus and then catches a train.

The probability that the bus is on time is 0.6

The probability that the bus is late is 0.4

If the bus is on time, then the probability that she will catch the train is 0.8

If the bus is late, then the probability that she will catch the train is 0.6

Given that Sylvie catches the train, what is the probability that the bus was on time?

A $\frac{1}{3}$

B $\frac{12}{25}$

C $\frac{2}{5}$

D $\frac{3}{5}$

E $\frac{2}{3}$

F $\frac{18}{25}$

G $\frac{6}{7}$