SAME BIRTH MONTH

The probability that two people in a group have birthdays in the same month depends on the size of the group.

What if the group has more than twelve people?

What about a group of 2 people? What is the probability they have birthdays in different months?

What about a group of 3 people? Let's call them A, B and C.

Suppose A and B have birthdays in different months. What is the probability that C's birthday is in a different month from A and B?

What is the probability that A, B and C all have birthdays in different months?

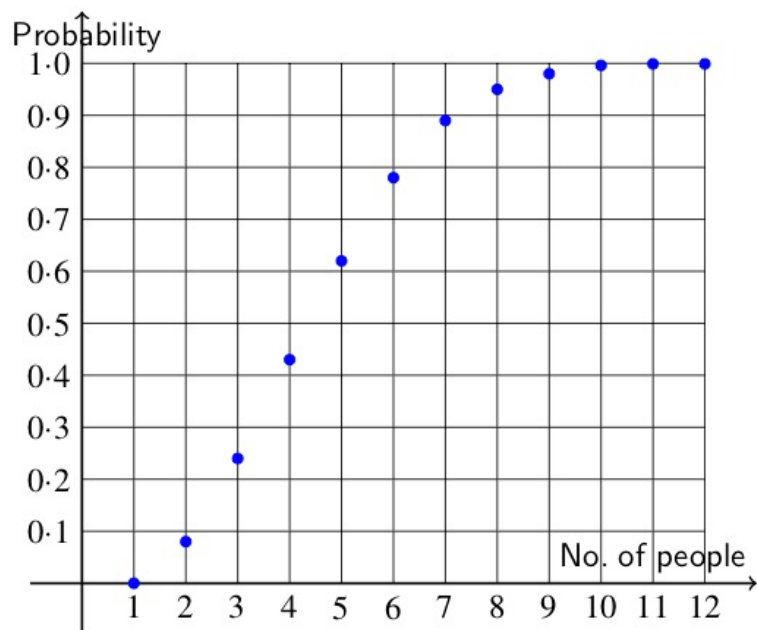What is the probability of two of them having birthdays in the same month?

Calculate the probability for larger groups of two people in the group having birthdays in the same month.

The table and graph below give you some of these answers.

A tree diagram is useful, but you don't need to draw all the branches.

The challenge is to understand and to be able to explain the method.

Number of people in group	Probability 2 people have same birth month
2	0.08
3	0.24
4	0.43
5	0.62
6	0.78
7	0.89
8	0.95
9	0.98
10	0.996
11	0.999
12	0.999
13	1

HELP

One of the 'golden rules' of problem solving is to work on simple cases when a problem seems difficult.

If you find this problem difficult then try 'Same Sweets'.
A bag has a large number of green, white, orange, yellow and red sweets.
You pick sweets from the bag without looking.
If you pick 2 sweets what different combinations of colours can you get?
If you pick 2 sweets how likely are you to pick two of the same colour?
If you pick 6 sweets what is the probability that two are the same colour?

https://aiminghigh.aimssec.ac.za/years-4-to-7-same-sweets/ is a simple version of the Same Birth Month problem with 5 different possibilities rather than 12.

NEXT

Try the 'Same Birthday' problem. In a group of 25 people what is the probability that two people have **exactly the same birthday**?

https://aiminghigh.aimssec.ac.za/years-10-to-12-same-birthday is an extension of this problem with 366 different possibilities (days in a year) rather than 12 different possibilities, the months in a year.