

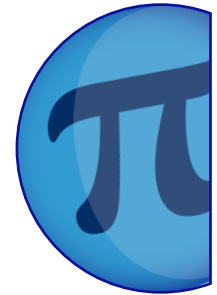


# The Birthday Paradox

NAME: .....

CLASS: .....

DATE: .....



## Basic

1) Ask a friend to think of a whole number from 1 to 10. What is the probability that the number will be:

- a) 8?
- b) greater than 5?
- c) less than 11?
- d) an odd number?
- e) eleven?

2) The letters in the word PROBABILITY are written on separate cards and placed face down on a table. If you pick a card at random, what is the probability that the letter on it will be:

- a) The letter R?
- b) The letter I?
- c) A vowel?
- d) Either the letter A or B?

3) If you can buy a light bulb in a choice of six sizes and three different colours, how many different bulbs can you choose from?



# The Birthday Paradox

## Basic

4) How many different vans can you get from three styles, four colours and three different engine sizes?

5) A jar contains eight blue, six pink, and four yellow marbles. If you take one without looking, what is the probability that the marble you pick will be:

a) blue?

b) green?

c) blue, pink or yellow?

d) neither blue nor pink?

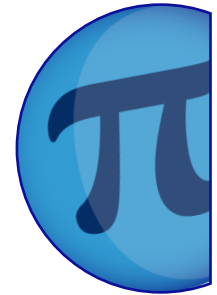


# The Birthday Paradox

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## Core

1) How many different vans can you get from three styles, four colours and three different engine sizes?

2) A jar contains eight blue, six pink, and four yellow marbles. If you take one without looking, what is the probability that the marble you pick will be:

a) blue?

b) green?

c) blue, pink or yellow?

d) neither blue nor pink?

3) A bag contains a mixture of red and green marbles. Two marbles are taken at random from the bag.

a) What are all the possible colour outcomes for these two marbles?

b) How many outcomes include a red marble?

c) How many outcomes include a green marble?



# The Birthday Paradox

## Core

4) A bag contains three red balls and four green balls. A ball is taken out at random, and is then put back in the bag; a second ball is then taken from the bag. What is the probability that:

a) both balls are the same colour?

b) at least one ball is red?

c) the balls are of different colours?

5) In Alison's drawer she has two red shirts and four blue shirts. She takes two shirts out at random. What is the probability that she has taken out two shirts of the same colour?

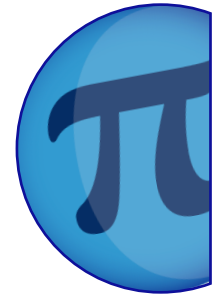


# The Birthday Paradox

NAME: .....

CLASS: .....

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## Advanced

1) A bag contains three red balls and four green balls. A ball is taken out at random, and is then put back in the bag; a second ball is then taken from the bag. What is the probability that:

a) both balls are the same colour?

b) at least one ball is red?

c) the balls are of different colours?

2) In Alison's drawer she has two red shirts and four blue shirts. She takes two shirts out at random. What is the probability that she has taken out two shirts of the same colour?

3) A bag contains three red balls and four green balls. A ball is taken out at random, and is not put back in the bag; a second ball is then taken from the bag. What is the probability that:

a) both balls are the same colour?

b) at least one ball is red?

c) the balls are of different colours?



# The Birthday Paradox

## Advanced

4) A student beginning a new course has to travel to the university by train. The train timetable shows a train leaving at 7.30am which arrives at the station near the university just before the first class begins. The trains on this line arrive on time 93.6% of the time. What is the chance of the student being late for lesson on the first day of the course?



# The Birthday Paradox

## ANSWERS

### Basic

- 1) a)  $\frac{1}{10}$       b)  $\frac{1}{2}$       c) 1      d)  $\frac{1}{2}$       e) 0
- 2) a)  $\frac{1}{11}$       b)  $\frac{2}{11}$       c)  $\frac{4}{11}$       d)  $\frac{3}{11}$
- 3) 18
- 4) 36
- 5) a)  $\frac{4}{9}$       b) 0      c) 1      d)  $\frac{2}{9}$

### Core

- 1) 36
- 2) a)  $\frac{4}{9}$       b) 0      c) 1      d)  $\frac{2}{9}$
- 3) a) RR, RG, GR, GG      b) 3      c) 3
- 4) a)  $\frac{25}{49}$       b)  $\frac{33}{49}$       c)  $\frac{24}{49}$
- 5)  $\frac{7}{15}$

### Advanced

- 1) a)  $\frac{25}{49}$       b)  $\frac{33}{49}$       c)  $\frac{24}{49}$
- 2)  $\frac{7}{15}$
- 3) a)  $\frac{3}{7}$       b)  $\frac{5}{7}$       c)  $\frac{4}{7}$
- 4) 6.4%