Problem 1: Sam's Sandwich

Every morning Sam makes his own sandwich. He can use brown or white bread and can choose between honey, cheese, vegemite, lettuce, or tomato.

How many different sandwiches can Sam make with one filling?

If Sam makes each possible sandwich equally often, what is the probability that he makes a white sandwich with honey for lunch today?

Problem 2: Pete's Pizza

At Pete's Pizza there is a special on. You can choose two toppings on your pizza. One single choice has to be made from the ham, mushroom, pepperoni, and bacon bins , while the other single choice has to come from the pineapple, tomato and extra cheese bins.

How many different pizzas are possible with 2 toppings?

If people choose the toppings at random, what's the probability that Pete will sell a bacon and tomato pizza next? (Random means that the choice of each topping is equally likely.)

Problem 3: Coin Tossing

Georgia is captain of her netball team and always selects heads at the start of the game.

What is the probability that she will win the toss for the next four games?
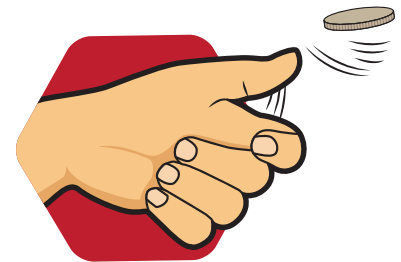
Problem 4: Licence Plates

In Botutuland, car licence plates have two letters and four digits. If all of the 10 digits can occur in any one of the four spots how many different licence plates are possible?

If all the licence plates are being used, what's the probability of a Botutulandian seeing a licence plate with 0000?

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Problem 5: Travel

Laura can travel from her home to the city by train, ferry or bus. Then she can walk, taxi or cycle from the transport terminal to her office.

How many different ways can she travel from her home to her office?

If she is just as likely to select any of the transport types what is the probability that she will travel by ferry and then walk to her office?
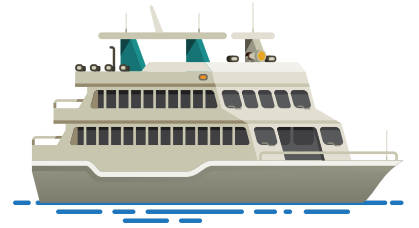
Problem 6: Sports

At Tim's school students can chose one sport from cricket, surfing, tennis, or touch rugby in the summer. They can choose one sport from soccer, hockey, rugby, or basketball in the winter.

How many different sports combinations are possible?

Imagine that players drew the sports randomly, like out of two hats, and each sport had the same chance of selection. What is the probability that Tim plays only sports that involve a round ball?

What is the probability of Tim **not** playing rugby?

Problem 7: Spinners I

Mala has a spinner that is divided into quarters with the numbers 1, 2, 3, 4 separately on each quarter. She plays the odd and even game with her friend Erik. Is this a fair game?

What event(s) has probability 10/16?

(An event is a particular outcome set, like an odd total, or an even total, or a total greater than three.)

Problem 8: Spinners II

Mala has a spinner that is divided into quarters with 1s in two of the opposite quarters and 2 and 3 in the other two quarters. She plays the odd and even game with her friend Erik.

Is this a fair game?

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Problem 9: Spinners III

Mala has a spinner that is divided into quarters with 1s in two of the opposite quarters and 2 and 3 in the other two quarters. She and her friend Erik spin the spinner twice and add the scores of the two spins.

Mala wins if the total is divisible by 3 and Erik wins if it is not.

Is this a fair game?

Problem 10: Spinners IV

Mala has a spinner that is divided into quarters with 1s in two of the opposite quarters and 2 and 3 in the other two quarters. She plays the following game with her friends Erik and Nelio.

The scores of two spins are added. Mala wins if the sum is divisible by 3; Erik wins if the sum has a remainder of 1 when divided by 3; and Nelio wins if the remainder is 2 when the sum is divided by 3.

Is this a fair game?

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