

Probability

Name: _____

Date: _____

Concepts

- Geometric Probability - Secondary 3
- Probability
- Permutations, Arrangements and Combinations

Geometric Probability - Secondary 3

1. In each situation a point is chosen at random inside the object described. Find the probability asked for, and say whether you compared **lengths**, **areas** or **volumes**.

- A guardrail along a boardwalk in Rimouski is 20 m long. The stretch between the 8 m mark and the 13 m mark has been repainted. A gull lands at a random point of the guardrail. What is the probability that it lands on the repainted stretch?
- A cork board in a school hallway measures 120 cm by 80 cm. A poster measuring 40 cm by 30 cm is pinned flat on it. A thumbtack is pushed in at a random point of the board. What is the probability that it goes through the poster? Give the answer as a fraction and as a percentage.
- A rectangular tank has a base measuring 60 cm by 40 cm, and it stands 30 cm deep. It is completely full of water, and a tiny air bubble forms at a random point of the water. What is the probability that it forms in the bottom 10 cm of water?

Permutations, Arrangements and Combinations

2. A bubble-tea shop in Trois-Rivières has five flavours: mango (A), taro (B), matcha (C), lychee (D) and melon (E).

- a) The owner will put three of the five flavours on a poster, one under the other, so a first, a second and a third are named. Reason out how many different posters are possible. Explain your reasoning; do not use a formula.
- b) Instead, she chooses three of the five flavours to put on special. This time the order means nothing — “A, B, C” and “C, A, B” are the same special. How many different specials are possible? Explain how this answer is related to the one in a).
- c) List all the specials from b), using the letters, to check your count.

Probability

3. Three situations are described below.

- a) One card is drawn from a shuffled set of 12 cards numbered 1 to 12. Find the probability that the number drawn is a multiple of 4.
- b) A raindrop falls on a rectangular tarp measuring 2 m by 5 m, landing at a random point of it. A square patch measuring 1 m by 1 m is painted in the middle of the tarp. Find the probability that the drop lands on the patch.
- c) A bottle cap is flipped 400 times and lands upright 148 times. Find the probability that it lands upright.

For each one, name the kind of probability you used — counting the equally likely outcomes of a sample space, comparing measurements of a figure, or using the results of repeated trials. Then say which of the three probabilities could come out differently if the whole situation were carried out again tomorrow, and why.

Synthesis — drawing on several sheets in this topic

4. A mural on a school wall is a rectangle 6 m wide and 4 m high, ruled into a grid of squares measuring 1 m by 1 m.
- a) How many squares does the grid contain?
 - b) The four squares forming a 2×2 block in one corner are painted gold. A drop of paint falls at a random point of the mural. Find the probability that it lands on gold.
 - c) The art teacher will sign two of the six squares along the bottom row. The order of the two signatures does not matter. Reason out how many different pairs of squares she could sign, then list them, numbering the bottom-row squares 1 to 6 from the left.
 - d) She picks one of those pairs at random. Find the probability that the two signed squares are side by side.

Want the harder problems and the worked solutions?

The *Challenge Problems* set and the *Answer Keys* for Probability — with the reasoning written out in full — are available at tutorinmontreal.ca.