


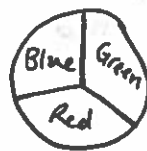
Unit 11: Probability

A: Probabilities with Tree Diagrams and Tables

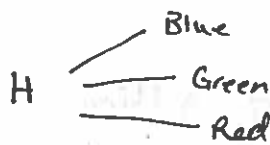
- Sample Space: list of all possible outcomes of a probability experiment.
- Probability = $\frac{\text{\# of favourable outcomes}}{\text{total \# of outcomes}}$ (what you want)
- $P(A, B)$ represents the probability of both A and B happening.
- $P(A)$ represents the probability of A happening.

Examples:

1. A spinner is divided into 3 equal regions.  coin is flipped and the spinner is spun once.



Coin Spinner



- a) Draw a tree diagram to represent the sample space.
(see above)

- b) List the sample space.

(H, B) (H, G) (H, R) (T, B) (T, G) (T, R)

- c) What is the probability of $P(H, G)$?

$$P(H, G) = \frac{1}{6} \left(\frac{H: \text{Green}}{3} \right) = 0.1\bar{6} = 16.\bar{6}\%$$

2. Two six-sided dice are each rolled once. Each die is numbered 1, 2, 3, 4, 5, 6.

a) Create a table to represent the sample space.

	1	2	3	4	5	6
1	1, 1	1, 2	1, 3	1, 4	1, 5	1, 6
2	2, 1	2, 2	2, 3	2, 4	2, 5	2, 6
3	3, 1	3, 2	3, 3	3, 4	3, 5	3, 6
4	4, 1	4, 2	4, 3	4, 4	4, 5	4, 6
5	5, 1	5, 2	5, 3	5, 4	5, 5	5, 6
6	6, 1	6, 2	6, 3	6, 4	6, 5	6, 6

b) What is the probability that the sum is greater than eight.

$$P(\text{sum} > 8) = \frac{10}{36} = \frac{5}{18} = 0.2\bar{7} = 27.\bar{7}\%$$

c) What is the probability that both numbers are the same.

$$P(\text{same numbers}) = \frac{6}{36} = \frac{1}{6} = 0.1\bar{6} = 16.\bar{6}\%$$

3. You pick from a bag. You have an equal chance of getting 10, 100, 1000 or 0. If you pull twice what might you choose?

a) Draw a table showing the possible results.

	10	100	1000	0
10	10, 10	10, 100	10, 1000	10, 0
100	100, 10	100, 100	100, 1000	100, 0
1000	1000, 10	1000, 100	1000, 1000	1000, 0
0	0, 10	0, 100	0, 1000	0, 0

b) What is $P(10, 1000)$ in either order?

$$P(10, 1000) = \frac{2}{16} = \frac{1}{8} = 0.125 = 12.5\%$$

c) What is $P(1000, 1000)$?

$$P(1000, 1000) = \frac{1}{16} = 0.0625 = 6.25\%$$

d) What is the probability you will not pull anything?

$$P(0, 0) = \frac{1}{16} = 0.0625 = 6.25\%$$