

Chapter 9: Statistics and probability

CH 9.4 - Determining probability using fractions

Simulation - an experiment that can be used to model a real life situation

Theoretical probability - the mathematical likelihood of something happening

- The probability we calculate

Experimental results - the actual results of conducting an experiment or running a simulation

Calculating probability using fractions

The probability of independent events can be calculated by multiplying the probabilities of each event.

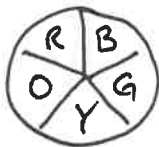
Independent Event - The outcome of one event has no effect on the outcome of another event

Ex. rolling a 2 on a dice does not change the probability of your next roll being any number between 1-6

Example: Roll a 6 sided dice and spin a spinner that is split into 5 equal regions, each with a different color; red, blue, green, yellow, and orange

a. Find the following probabilities

P(3, blue)



$$\begin{aligned} &P(3, \text{Blue}) \\ &= P(3) \times P(\text{Blue}) \\ &= \frac{1}{6} \times \frac{1}{5} \\ &= \frac{1}{30} \end{aligned}$$

P(even, red or green)

$$\begin{aligned} &= P(\text{even}) \times P(R \text{ or } G) \\ &= \frac{3}{6} \times \frac{2}{5} \\ &= \frac{6}{30} \text{ or } \frac{1}{5} \end{aligned}$$

P(<5, not orange)

$$\begin{aligned} &= P(<5) \times P(\text{not orange}) \\ &= \frac{4}{6} \times \frac{4}{5} \\ &= \frac{16}{30} \text{ or } \frac{8}{15} \end{aligned}$$

- b. Use a table or a tree diagram to show the sample space of the experiment to verify your calculations.

	1	2	3	4	5	6
R	R1	R2	R3	R4	R5	R6
B	B1	B2	B3	B4	B5	B6
G	G1	G2	G3	G4	G5	G6
Y	Y1	Y2	Y3	Y4	Y5	Y6
O	O1	O2	O3	O4	O5	O6

$P(3, \text{Blue})$

$$\frac{1}{30}$$

$P(\text{even}, R \text{ or } G)$

$$\frac{6}{30} \text{ or } \frac{1}{5}$$

$P(<5, \text{not orange})$

$$\frac{16}{30} \text{ or } \frac{8}{15}$$

Practice assignment:

- CH 9.4 extra practice worksheet (if in class)
- Page 328 # 1-5, 2 apply questions