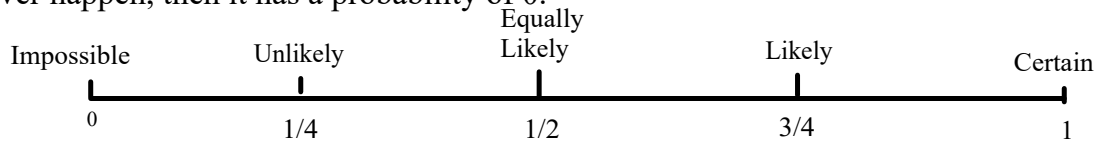


Probability

Probability is the chance of an event happening. It can be written as a fraction, a decimal or as a percent. If something is certain to happen, then the probability is 1. If something could never happen, then it has a probability of 0.



Examples of events with the given probabilities are:

Probability is 0.

- of dinosaurs walking through the wall
- in NB, for the sun to shine 24 hours straight
- for pigs to fly
- for Toronto to win the Stanley Cup in 2014 (they are already eliminated)

Probability of $1/4$. = 0.25 \Rightarrow 25%

- for the speaker to fall off the table
- for it to snow in May.
- to pick a blue marble out of bag that has 3 red and 1 blue marble
- of it raining if the weather forecasts a 25% chance of rain

Probability of $1/2$

- of a baby being born a boy (or a girl)
- flipping a head on a coin
- of picking a yellow straw out of a container that contains 2 red and 2 yellow straws
- of randomly guess a true or false question and getting it right

Probability of $3/4$

- for somebody in 7H to ask to go to the washroom during class
- for the power to stay on during class time (very likely)
- that there will be math homework tonight
- choosing a red marble out of a bag with 3 red and 1 black marble.

Probability of 1

- that your first name will be the same tomorrow (as long as you do not try to legally

get
it changed)

- that there will be 7 days in a week
- that you will not live forever
- that there will be 24 hours in a day

Theoretical Probability is found by dividing the number of favorable outcomes by the total number of possible outcomes.

$$P(\text{fav}) = \frac{\text{\# of outcomes favorable to that event}}{\text{Total \# of possible outcomes}}$$

Examples of "Possible outcomes" for:

Rolling a die: 1, 2, 3, 4, 5, 6

Days of the week: Mon., Tues., Wed., Thurs., Fri., Sat., Sun

For a baby being born: boy or girl

Favorable outcomes:

For rolling an even number on a die: 2, 4, 6

For the day of the week starting with S: Sat., Sun.,

$$P(\text{even on die}) \Rightarrow \frac{\text{\# even}}{\text{total}} \Rightarrow \frac{3}{6}$$

Reduce $\Rightarrow \frac{1}{2}$

$\rightarrow 0.5$
 $\rightarrow 50\%$

Ex) Probability of rolling an even number on a die

As fractions reduced

$$\text{Prob(rolling even)} = \frac{3}{6} = \frac{1}{2}$$

as ratio of part to whole

as a percent???

Ex 2) Prob (a baby being a girl) = $\frac{1}{2}$

Your Turn

Ex 3) A bag contains 5 orange marbles, 3 pink marbles, 2 green marbles and 10 Blue marbles

Total Marbles $\Rightarrow 20$



a) What is the probability of orange? (as fraction and percent)

$$P(\text{orange}) = \frac{\text{\# of orange}}{\text{Total}} = \frac{5}{20} \text{ Reduce } \frac{1}{4} \Rightarrow 0.25 = 25\%$$

b) What is the probability of pink? (as fraction and percent)

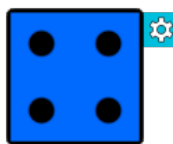
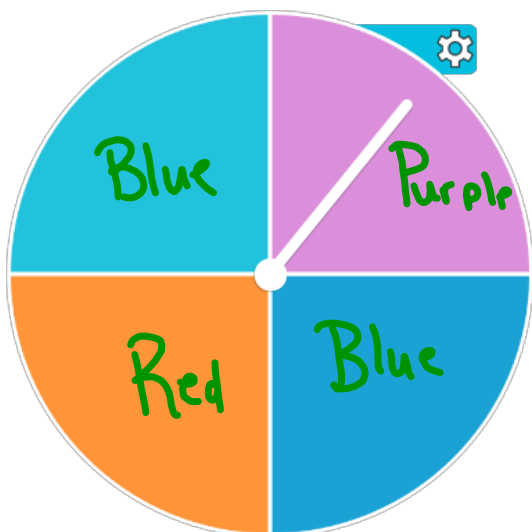
$$P(\text{Pink}) = \frac{\text{\# pink}}{\text{Total}} = \frac{3}{20} = 0.15 = 1.5\%$$

$\times 100 \text{ to get } \%$

c) What is the probability of pink, orange or green? (as fraction and percent)

$$P(\text{Pink orange or green}) = \frac{\text{\# pink orange or green}}{\text{Total}} = \frac{3 + 5 + 2}{20} = \frac{10}{20} = \frac{1}{2} = 0.5 = 50\%$$

Experimental Probability is when you actually do the the experiment. For example, spin the spinner 12 times to see how many times it lands on red, OR roll a die 20 times to see how many times it will land on 5.



1, 1,

R, B, P, B
B, B, R, B
P, P, R, B

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1 to #6

1. Prob(3 or 5) = $\frac{2}{6}$

or $\frac{1}{3}$, Ratio, 1:3, 1 out of 3
33% 0.33

$$3 \text{ } P(\text{Joe wins}) = \frac{1}{100}$$

$$4 \text{ d) } P(\text{grey})$$