Q: How do experimental and theoretical probabilities compare?

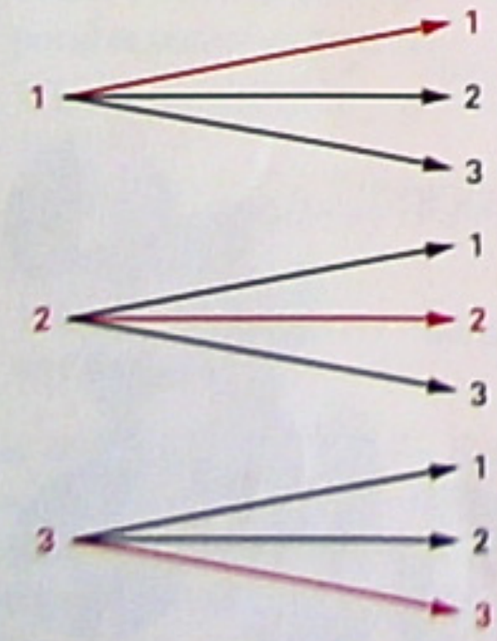
A: The greater the number of trials in an experiment, the closer the theoretical and experimental probabilities should be. The values will not likely be exactly the same, but they should be close.

For example, Ashley wondered whether the numbers 0 to 9 are equally likely to appear in the last position in a business telephone number. If all the numbers are equally likely, the theoretical probability of a business telephone number ending in 1 should be $\frac{1}{10}$. Ashley looked at 100 numbers in the yellow pages of her telephone book. She found 22 numbers that ended in a 1, for an experimental probability of $\frac{22}{100}$, or $\frac{11}{50}$.

Because the experimental and theoretical probabilities were so different, Ashley decided that the numbers 0 to 9 could not be equally likely in the last position in a business telephone number.

Q: How can you use a tree diagram to calculate a probability?

A: The number of branches tells you the number of equally likely possible outcomes. The denominator of the fraction form of the probability is the number of branches. The numerator is the number of branches that represent favourable outcomes.



For example, two spins of this spinner can be represented by a tree diagram with nine branches, or nine possible outcomes.

What is the probability that the second spin is the same as the first spin?

There are three branches that represent favourable outcomes.

$P(\text{both spins the same}) = \frac{3}{9}$, or $\frac{1}{3}$

b) rolling a 1 using a stand

c) spinning a 9 with this spinner

d) drawing a black card from a standard deck of 52 cards

(12.2) **2. a)** Perform an experiment to experimental probability using a standard die. Con

b) Repeat part (a), but comp

c) How do your experiment probabilities compare wi theoretical probability yo in question 1(b)?

(12.2) **3.** Both Rick and Dominique spu 18 times, for a total of 36 spin fraction that matches each pro

a) the theoretical probability an odd number

b) the theoretical probability purple

c) an unexpected experimenta of spinning blue

d) an experimental probabili an even number