

Notes #7 ~ Sect. 1.6: Probability

Probability: Measures how likely to occur an event is.

Expressed as either ~ Percents : 0% through 100%
Real Numbers : 0 through 1

Probability of an impossible event is 0 or 0% .

Probability of a certain event (must happen) is 1 or 100% .

Experimental Probability: Gathering data from observations.

Each observation is called an experiment or a trial.

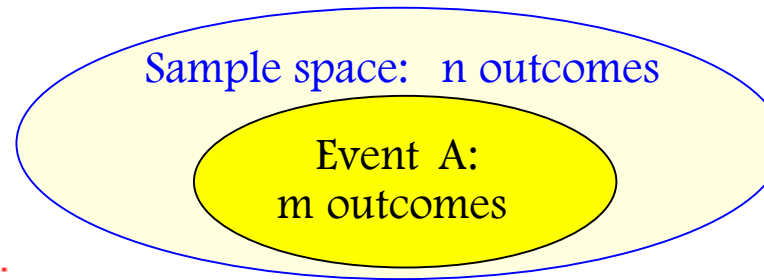
Experimental Probability of event = $P(\text{event})$

$$= \frac{\text{number of times the event occurs}}{\text{number of trials}}$$

Ex. 1: A player hit the bull's eye on a circular dartboard 8 times out of 50.
Find the experimental probability that the player hits the bull's eye.

Sample Space: The set of all possible outcomes.

Theoretical Probability: If a sample space has n equally likely outcomes and an event A occurs in m of these outcomes, then the theoretical probability of event A is $P(A) = \frac{m}{n}$.



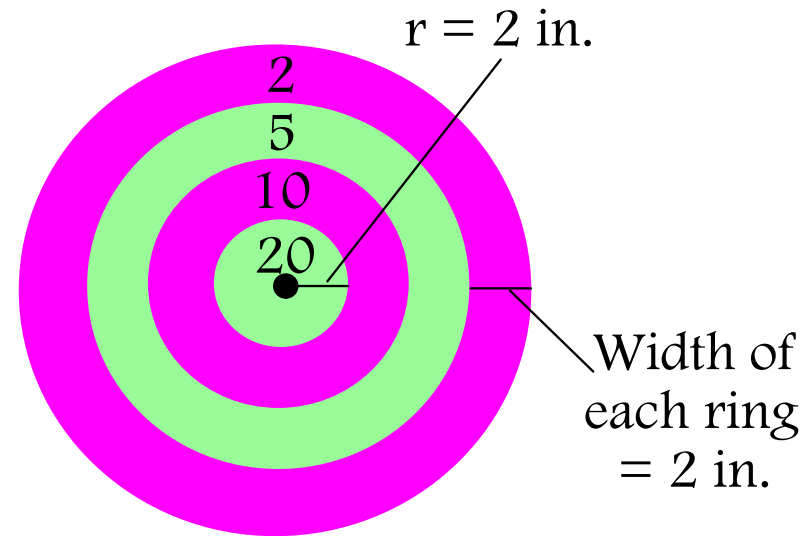
Ex. 3: Find the theoretical probability of rolling a multiple of 3 with a number cube.

Ex. 4: Brown is a dominant eye color for human beings. If a father and mother each carry a gene for brown eyes and a gene for blue eyes, what is the probability of their having a child with blue eyes?

Geometric Probability: $\frac{\text{area of desired outcome}}{\text{total area of sample space}}$

Ex. 5:

a) Suppose that all the points on the circular dartboard shown at the right are equally likely to be hit by a dart you have thrown. Find the probability of scoring at least 10 points .



b) P(scoring 20 points)