Conditions

A fair coin is tossed thrice. Find the probabilities of the following events.

a. Probability of obtaining two heads.
b. Probability of obtaining three tails.
c. Probability of obtaining a head and two tails

Solution

The classic definition of probability claims, that the probability of some random event A is equal to a rate of all favorable outcomes for this event to all possible outcomes.

a) The favorable outcomes for this event (at least 2 heads) are: heads-heads-heads, heads-heads-tails, heads-tails-heads, tails-heads-heads. Total is 4 outcomes. All possible outcomes are:

heads-heads-heads

heads-heads-tails

heads-tails-heads

tails-heads-heads

tails-tails-heads

tails-heads-tails

heads-tails-tails

tails-tails-tails

Total – 8.

So, the probability is:

$$P = \frac{4}{8} = \frac{1}{2}$$

b) The probability of event to get 3 tails has only one favorable outcome – tails-tails-tails. That's why the probability is:

$$P = \frac{1}{8}$$

c) This event has the following favorable outcomes: tails-tails-heads, tails-heads-tails, heads-tails-tails. That's why the probability is:

$$P = \frac{3}{8}$$