Worksheet 7A

Outcome: the most basic result of an observation or experiment

Event: collection of outcomes sharing a certain common property

Probability of event A: $P(A) = \frac{number\ of\ outcomes\ A\ consists\ of}{number\ of\ all\ possible\ outcomes}$

$\boldsymbol{P(not\ A)} = 1 - P(A)$

Odds for A $= \frac{P(A)}{P(not\ A)}$

Odds against A $= \frac{P(not\ A)}{P(A)}$

Multiplication principle: Consider a task that can be broken up into n consecutive steps. Assume that Step 1 can be done in k_1 ways, Step 2 can be done in k_2 ways regardless how Step 1 was done, Step 3 can be done in k_3 ways regardless how Steps 1 and 2 were done, and so on. Then the task itself can be done in $k_1 k_2 \ldots k_n$ ways.

1) Consider the experiment of tossing a fair coin 3 times.

a) Write all possible outcomes (such as HHH, HHT, …)

b) Circle the outcomes in which there is exactly one Tail.

c) Find the probability of the event of getting exactly one Tail.

2) Consider the experiment of rolling 2 dice.

a) Write all possible outcomes (such as 11, 12, …)

b) Circle the outcomes in which the sum of two faces is less than 7.

c) Find the probability that a sum of two faces is less than 7.

3) Consider the experiment of drawing a card from a standard deck of 52 cards.

a) Find the probability of getting a black card (club ♣ or spade ♠).

b) Find the probability of getting a face card (Jack, Queen, King).

4) A restaurant has a special menu that features two choices of salad, eight choices of entree, and six choices of dessert. How many different three-course meals could you order?

5) If you toss a coin 5 times, how many different outcomes are there?

6) How many possible outcomes are there if you toss three 6-sided dice?

7) If you draw two cards from a standard deck of 52 cards, how many different outcomes are there?

8) Toss 5 fair coins.

a) What is the probability of *not* getting 5 Heads?

b) What is the probability of getting *at least* 1 Head?

9) Find the *odds for* and the *odds against* the event of rolling two dice and getting *at least one* number 6.