***Calculating factorials, combinations, permutations.***

***Evaluate the given expressions and express all results using the usual format for writing***

***numbers (instead of scientific notation).***

**Factorial** Find the number of different ways that the nine players on a baseball team can

line up for the National Anthem by evaluating 9!.

**Card Playing** Find the number of different possible five-card poker hands by evaluating

52 *C* 5.

 **Scheduling Routes** A political strategist must visit state capitols, but she has time to

visit only 3 of them. Find the number of different possible routes by evaluating 50 *P3.*

**Trifecta** Refer to Exercise 3. Find the number of different possible trifecta bets in a race

with ten horses by evaluating 10 *P3.*

***In Exercise 22, use the data in the accompanying table, which summarizes***

***challenges by tennis players (based on data reported in* USA Today*). The***

***results are from the first U.S. Open that used the Hawk-Eye electronic system***

***for displaying an instant replay used to determine whether the ball is in***

***bounds or out of bounds. In each case, assume that one of the challenges is***

***randomly selected.***

 ***Was the challenge to***

 ***The call successful?***

 ***Yes no***

 ***Men 201 288***

 ***Women 126 224***

**Tennis Instant Replay** If *M* denotes the event of selecting a challenge made by a man,

find p (*M*).

***In Exercise 28, refer to the following table summarizing results from a study***

***of people who refused to answer survey questions (based on data from “I Hear***

***You Knocking but You Can’t Come In,” by Fitzgerald and Fuller,* Sociological**

**Methods and Research, *Vol. 11, No. 1). In each case, assume that one of the subjects***

***is randomly selected.***

 ***AGE***

 ***18-21 22-29 30-39 40-49 50-59 60+***

***Responded 73 255 245 136 138 202***

***Refused 11 20 33 16 27 49***

**Survey Refusals** A pharmaceutical company is interested in opinions of the elderly, because

they are either receiving Medicare or will receive it soon. What is the probability that

the selected subject is someone 60 and over who responded?

***express the indicated degree of likelihood as a probability***

***value between 0 and 1.***

**Weather** A WeatherBug forecast for the author’s home was stated as: “Chance of rain: 80%.”

**Births** When a baby is born, there is approximately a 50-50 chance that the baby is a girl.

**Roulette** When playing roulette in the Mirage Casino, you have 18 chances out of 38 of

winning if you bet that the outcome is an odd number.

**Identifying Probability Values**

1. What is the probability of an event that is certain to occur?
2. What is the probability of an impossible event?
3. A sample space consists of 10 separate events that are equally likely. What is the probability

***Of each?***

1. ***On a true/false test, what is the probability of answering a question correctly if you make a random guess?***
2. ***On multiply-choice test with five possible answers for each, what is the probability of answering a question correctly If you make random guess?***

**Genotypes** In Example 4 we noted that a study involved equally likely genotypes represented

as AA, Aa, aA, and aa. If one of these genotypes is randomly selected as in Example 4,

what is the probability that the outcome is AA? Is obtaining AA unusual?

 Example 4: **Genotypes** When studying the affect of heredity on height,

we can express each individual genotype, AA, Aa, aA, and aa, on an index card and

shuffle the four cards and randomly select one of them. What is the probability

that we select a genotype in which the two components are different?