

## Set 1 – Review Questions

### PROBABILITY 19

There are two games involving flipping a fair coin. In the first game, you win a prize if you can throw between 45 percent and 55 percent heads; in the second game, you win if you can throw more than 60 percent heads. For each game, would you rather flip the coin 30 times or 300 times?

- (A) 30 times for each game
- (B) 300 times for each game
- (C) 30 times for the first game, and 300 for the second
- (D) 300 times for the first game, and 30 for the second
- (E) The outcomes of the games do not depend on the number of flips.

### PROBABILITY 17

There are five outcomes to an experiment and a student calculates the respective probabilities of the outcomes to be .34, .50, .42, 0, and -.26. The proper conclusion is that

- (A) the sum of the individual probabilities is 1.
- (B) one of the outcomes will never occur.
- (C) one of the outcomes will occur 50 percent of the time.
- (D) all of the above are true.
- (E) the student made an error.

### PROBABILITY 22

Given that 49.0 percent of the U.S. population are male, and 12.1 percent of the population are over 65 years in age, can we conclude that  $(.490)(.121) = 5.93$  percent of the population are men older than 65?

- (A) Yes, by the multiplication rule
- (B) Yes, by conditional probabilities
- (C) Yes, by the Law of Large Numbers
- (D) No, because the events are not independent
- (E) No, because the events are not mutually exclusive

### PROBABILITY 9

A travel agent books passages on three different tours, with half her customers choosing tour  $T_1$ , one-third choosing  $T_2$ , and the rest choosing  $T_3$ . The agent has noted that three-quarters of those who take tour  $T_1$  return to book passage again, two-thirds of those who take  $T_2$  return, and one-half of those who take  $T_3$  return. If a customer does return, what is the probability that the person first went on tour  $T_2$ ?

- (A)  $1/3$  (B)  $2/3$  (C)  $2/9$  (D)  $16/49$  (E)  $49/72$

**PROBABILITY 23**

According to one poll, only 8 percent of the public say they "trust Congress." In a simple random sample of ten people, what is the probability that at least one person "trusts Congress"?

- (A) .188 (B) .378 (C) .434 (D) .566 (E) .622

**PROBABILITY 21**

The yearly average rainfall along the coast of Liberia is 210 inches. What is the standard deviation if 20 percent of the years have rainfalls under 200 inches? Assume yearly rainfalls are normally distributed.

- (A) 2.00 inches  
(B) 5.94 inches  
(C) 11.88 inches  
(D) 19.07 inches  
(E) The standard deviation cannot be computed from the information given.

**PROBABILITY 15**

Which of the following are true statements?

- I. The area under a normal curve is always equal to 1, no matter what the mean and standard deviation are.
- II. The smaller the standard deviation of a normal curve, the higher and narrower the graph.
- III. Normal curves with different means are centered around different numbers.

- (A) I and II (B) I and III (C) II and III (D) I, II, and III  
(E) None of the above gives the complete set of true responses.

**PROBABILITY 16**

A piece of clothing takes an average of 38 minutes to move through an assembly line. If the standard deviation is 4 minutes, and the distribution is normal, what is the probability that a piece of clothing will take over 45 minutes?

- (A) .040 (B) .080 (C) .175 (D) .227 (E) .460

**PROBABILITY 1**

Review Book A advertises an average SAT gain of 40 points with a standard deviation of 12 points, and Review Book B claims an average SAT gain of 35 points with a standard deviation of 15 points. Assuming both assertions are correct and assuming normal distributions, which review book is more likely to result in an SAT gain of over 60 points?

- (A) Review Book A because of its greater mean.
- (B) Review Book B because of its greater standard deviation.
- (C) For both plans, the probability of an SAT gain over 60 points is .04779.
- (D) For both plans, the probability of an SAT gain over 60 points is .95221.
- (E) The problem cannot be solved from the information given.

**PROBABILITY 12**

If  $P(A) = .25$  and  $P(B) = .34$ , what is  $P(A \cup B)$  if A and B are independent?

- (A) .085
- (B) .505
- (C) .590
- (D) .675
- (E) There is insufficient information to answer this question.

**PROBABILITY 2**

Suppose that the probabilities that an answer can be found on Google is .95, on Answers.com is .92, and on both websites is .874. Are the possibilities of finding the answer on the two websites independent?

- (A) Yes, because  $(.95)(.92) = .874$ .
- (B) No, because  $(.95)(.92) = .874$ .
- (C) Yes, because  $.95 > .92 > .874$ .
- (D) No, because  $.5(.95 + .92) \neq .874$ .
- (E) There is insufficient information to answer this question.

**PROBABILITY 4**

The following is from a particular region's mortality table.

| Age              | 0      | 20    | 40    | 60    | 80    |
|------------------|--------|-------|-------|-------|-------|
| Number Surviving | 10,000 | 9,700 | 9,240 | 7,800 | 4,300 |

What is the probability that a 20-year-old will survive to be 60?

- (A) .1959 (B) .4419 (C) .7800 (D) .8041 (E) .9700