PROBABILITY PROBLEMS

II.1. A die is rolled 4 times. If each of the numbers 1,2, 3,4,5,6 is equally likely to come up on each toss, what is the probability the number 6 comes up exactly two times?

(a) 1/18 (b) 25/216 (c) 1/3 (d) 25/324 (e) 1/9

II.35 Let M=number of poker hands with exactly one pair (no triples, four of a kind, or other pairs)

Let N=number of poker hands with exactly two pairs (no triples)

Let P=number of poker hands with three of a kind (no four of a kind or other pairs).

Then (M-N-P)/(13)(44)(8) =

(a) -100 (b) 1362 (c) 201 (d) 250 (e) 512

III.1 Three die are rolled, the numbers 1,2,3,4,5,6 being equally likely. What is the probability that all three numbers are different?

(a) 1/3 (b) 3/16 (c) 7/36 (d) 1/2 (e) 5/9

IV.1 Four coins are tossed. What is the probability that at least two heads occur?

(a) 1/2 (b) 11/16 (c) 3/8 (d) 1/3 (e) 5/8

IV.6 An urn contains 10 balls numbered 1 through 10. A ball is drawn at random from the urn, placed back in the urn,and then a ball is again drawn at random from the urn. What is the probability that the number on the last ball drawn is less than the number on the first ball drawn?

(a) 5/11 (b) 9/20 (c) 10/21 (d) 1/2 (e) 11/20

V.2 A coin is tossed until it comes up heads. What is the probability that 4 or more tosses are required?

(a) 1/8 (b) 3/16 (c) 1/4 (d) 3/64 (e) 5/64

V.12 Bill has $3 and Tom has $1. They toss a coin, and the loser pays the winner $1. This continues until either Bill or Tom has lost all his money. What is the probability there is at most 4 coins tossed before the betting is ended?

(a) 63/64 (b) 15/16 (c) 7/8 (d) 3/4 (e) 1/2

VI.9 An urn contains a red ball, a blue ball, and a green ball. Three times a ball is drawn at random from the urn and then replaced. What is the probability each of the three balls was drawn?

(a) 1/2 (b) 1/3 (c) 1/9 (d) 2/9 (e) 7/27

VII.24 An urn contains 3 black balls and 3 red ones. A ball is drawn from the urn; it is returned to the urn only if it is red. A second ball is drawn from the urn; it also is returned to the urn only if it is red.A third ball is drawn from the urn; the probability it is red is

(a) 1/2 (b) 2/3 (c) 63/100 (d) 113/180 (e) 121/200

VIII.9 Three dice are rolled. What is the probability that the three numbers that occur are all different?

(a) 25/36 (b) 119/216 (c) 7/18 (d) 2/3 (e) 5/9

VIII.20 An urn has 2 black and 3 red balls. Bill draws a ball from the urn and puts it back only if it is black. Mary then draws a ball from the urn. The probability Mary draws a red ball is

(a) 3/7 (b) 12/25 (c) 15/36 (d) 13/30 (e) 27/50

IX.16 Three dice are rolled. The probability that exactly two different numbers occur is

(a) 1/3 (b) 5/12 (c) 5/9 (d) 11/36 (e) 71/216 .

IX.22 An urn contains 10 balls numbered 0,1,2,3,4,5,6,7,8,9. Three balls are drawn from the urn (no balls are returned to the urn). The probability that the sum of the three numbers on the drawn balls is less than 9 is

(a) 1/7 (b) 2/15 (c) 193/720 (d) 11/60 (e) 29/120 .

X.2 Two red dice and two green dice are rolled. The probability the sum on the red dice equals the sum on the green dice is

(a) 73/648 (b) 1/6 (c) 7/36 (d) 55/216 (e) 1/2

X.28 In the major league world series two teams play until one team wins 4 games; that team is then the winner. If both teams are equally likely to win each game, what is the probability the series will end in exactly 5 games?

(a) 3/16 (b) 1/4 (c) 5/32 (d) 1/8 (e) 1/5

X.29 In the Florida State lottery six numbers are selected from the integers 1 through 49 to give the winning combination. Contestants select six numbers and if they pick the winning combination then they are a winner. Cash awards are also given when the selection includes exactly five of the winning combination. If w is the probability of selecting all six winning numbers and s is the probability of selecting exactly five winning numbers then s/w =

(a) 258 (b) 986 (c) 664 (d) 1468 (e) 64