MATH-1110 (DUPRÉ) PRACTICE TEST PROBLEMS

FIRST: PRINT YOUR LAST NAME IN LARGE CAPITAL LETTERS ON THE UPPER RIGHT CORNER OF THIS SHEET.

SECOND: PRINT YOUR FIRST NAME IN CAPITAL LETTERS DIRECTLY UNDERNEATH YOUR LAST NAME.

THIRD: WRITE YOUR FALL 2010 MATH-1110 LAB DAY DIRECTLY UNDERNEATH YOU FIRST NAME.

STANDARD INFORMATION: A **Standard Dice** has six faces and each face has a number of spots, that number being a positive whole number no more than six. The total number of spots on any pair of opposite faces is seven. Since there are exactly three pair of opposite faces, the total number of spots on a dice is twenty one. Therefore if we think of the spots as distributed evenly over the faces, there are on average 3.5 spots per face. A **Standard Deck of Cards** has 52 cards, four suits of 13 cards (denominations) each. The four suits are spades (♠), hearts(♡), diamonds(♢), and clubs(♣). Each suit has 3 face cards: Jack, Queen, King, and an Ace. In each suit, the cards which are not face cards each have a number of spots in the shape of the particular suit, the number of spots being a whole number no more than ten, the card with a single spot being the Ace of that suit. For example, the card with four spots each in the shape of a diamond is called "the four of diamonds($4\diamondsuit$)", whereas the card with the face labelled with "J" and a spade shaped spot is "Jack of spades($J\spadesuit$)". In many card games, an Ace can count as a denomination value of one or as a denomination higher King as a player desires. A Jack has denomination value eleven, a Queen has denomination value twelve, and a King has denomination value 13, in many card games. In the game of Black Jack or Twentyone, all face cards are given denomination value ten and all aces have denomination value eleven or one as desired by the player. A **Standard (American) Roulette Wheel** has a spinner with 38 slots which spins in a large bowl. A ball is sent rolling in opposite direction to the spin of the wheel near the upper rim of the bowl and as both the spinning wheel and ball slow down, the ball falls into one of the 38 slots. Two of the slots are colored green, one labelled zero (0) and the other labelled with two zeros (00), and referred to as "double zero". The remaining slots are each colored either red or black and numbered with the positive whole numbers no more than 36. At the roulette table a player can bet on zero or on double zero or on a specific positive whole number, or on even or on odd or on red or on black or on one through eighteen, or on one through twelve, or on 13 through 24, or on 25 through 36. There are therefore many possibilities for placing bets at the roulette wheel. The game of craps is played on a large oblong table with rounded ends and with vertical walls around the edges. The player who rolls the dice is called "the shooter" and must toss a pair of standard dice so as to hit the table's horizontal surface and bounce off the wall at the opposite end of the table back on the horizontal surface where it finally comes to rest. If any side is touching a vertical wall or is tilted off horizontal or goes off the table, then it does not count and the pair of dice must be tossed again-it is a "do over". Notice that it is virtually impossible to tell what faces will come up when a pair of dice is thrown, or which card will come up when a card is taken off the top of a shuffled deck, or what slot the ball will land on when the roulette wheel is spun. All the processes obey the laws of physics which are completely deterministic. However, the circumstances are guaranteed to make the use of physics to predict the outcomes virtually useless, as there is no practical way to keep track of the information required. Thus, the so-called "random" processes are really "randumb" processes, as they depend on reducing our information below what can be used to make any effective prediction. On the other hand,

it is known that a very few people with practice have learned to throw the dice so as to have a fair amount of control over the outcomes and as of this time the major casinos do not admit that as a possibility so these few players have a tremendous advantage at the crap table.

1. Suppose that Sam guesses that his Master Charge card balance is 1450 dollars and his Visa card balance is 2500 dollars. What should he guess for the total he owes on both credit cards in order to be consistent?

2. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted, then based only on this information (whether or not you believe it) what should you guess is the probability that the face on top has 4 spots?

3. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted, then based only on this information (whether or not you believe it) what should you guess is the probability that the face on top has an even number of spots?

4. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted, then based only on this information (whether or not you believe it) what should you guess is the probability that the face on top has an odd number of spots?

5. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted and the top face has an even number of spots, then based only on this information (whether or not you believe it) what should you guess is the probability that the face on top has 4 spots?

6. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted and the top face has an even number of spots, then based only on this information (whether or not you believe it) what should you guess is the probability that the face on top has 5 spots?

7. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted and the top face has an even number of spots, then based only on this information (whether or not you believe it) what should you guess is the number of spots on the top face?

8. If a dice is in a box where you cannot see it and I look into the box and see it and tell you it is sitting with one of its faces on the floor of the box and one face on top-it is not tilted and the top face has an odd number of spots, then based only on this information (whether or not you believe it) what should you guess is the number of spots on the top face?

9. If X is a positive whole number that I have chosen and you think X is three times as likely to be even as odd, then what should you think is the probability that X is odd?

10. If X is a positive whole number with $X \leq 6$ that I have chosen and you think X is three times as likely to be even as odd, and if K is a symbol that stands for this information, then what is $E(X|K)$?

11. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the top card is a heart?

12. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the top card is a diamond?

13. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the second card is a heart?

14. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the third card is a heart?

15. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the fourth card is a heart?

16. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the last card is a heart?

17. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the second and fifth cards ares hearts?

18. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the fourth is a heart, given that the fifth is a spade?

19. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the fourth is a heart given that the third is a spade?

20. If fourteen cards are dealt from the top of a well shuffled deck of cards one after another without replacement, what is the chance that the fourth is a heart given that the third is a heart, the fifth is a heart, the sixth is a club, and the seventh is a club?

21. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the first block drawn is red?

22. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the last block drawn is red?

23. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the fourth block drawn is red?

24. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the second block drawn is red given that the first is red?

25. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the first block drawn is red given that the second is red?

26. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the second block drawn is red given that the first and third are both red?

27. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the fifth block drawn is red given that the first and third are both red and the seventh is green?

28. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the fifth block drawn is red given that the first and third are both red the seventh is green and the eighth is blue?

29. A box contains 5 red blocks, 8 blue blocks, and 7 green blocks. A lab assistant who is totally color blind is told to remove the blocks from the box one by one without replacement. What is the probability that the fifth and ninth blocks drawn are both red given that the first and third are both red the seventh is green and the eighth is blue?

30. Suppose that A, B and C are statements and that $P(A|B\&C) = .4$, that $P(A|C) = .7$, and that $P(B|C) = .6$. Calculate $P(B|A\&C)$.

31. Suppose that A and B are statements and set $C =$ *not B*. Suppose $P(A|B) = .7$ and $P(A|C) = .8$. Finally, suppose that $P(B) = .3$. Calculate $P(A\&B)$.

32. Suppose that A and B are statements and set $C =$ *not B*. Suppose $P(A|B) = .7$ and $P(A|C) = .8$. Finally, suppose that $P(B) = .3$. Calculate $P(A\&C)$.

33. Suppose that A and B are statements and set $C =$ *not B*. Suppose $P(A|B) = .7$ and $P(A|C) = .8$. Finally, suppose that $P(B) = .3$. Calculate $P(A)$.

34. Suppose that A and B are statements and set $C =$ *not B*. Suppose $P(A|B) = .7$ and $P(A|C) = .8$. Finally, suppose that $P(B) = .3$. Calculate $P(B|A)$.

35. Suppose A and B are statements with $P(A) = .4$ and $P(B) = .3$. Calculate $P(A \text{ or } B)$ assuming $P(A\&B) = .2$.

36. Suppose A and B are statements with $P(A) = .4$ and $P(B) = .3$. Calculate $P(A \text{ or } B)$ assuming A and B are exclusive.

37. Suppose A and B are statements with $P(A) = .4$ and $P(B) = .3$. Calculate $P(A \text{ or } B)$ assuming A and B are independent.

38. Suppose that a box contains 30 blocks. How many ways are there to take 5 blocks from the box?

39. Suppose that a one box contains 20 blocks and another box contains 30 blocks. If the contents of both boxes are dumped into a third box, how many blocks will be in the third box?

40. Suppose that a box contains 70 RED blocks and ONE BLUE BLOCK for a total of 71 blocks. How many ways are there to draw 20 blocks from the box so as to have the blue block as one of the blocks drawn?

41. Suppose that a box contains 70 RED blocks and ONE BLUE BLOCK for a total of 71 blocks. How many ways are there to draw 20 blocks from the box so as to NOT have the blue block as one of the blocks drawn?

42. Suppose that a box contains 70 RED blocks and ONE BLUE BLOCK for a total of 71 blocks. How many ways are there to draw 20 blocks from the box IF WE DO NOT CARE WHETHER OR NOT the blue block is one of the blocks drawn?

43. Supose that we have a bucket with ten numbered blocks numbered one through ten and we have three empty numbered buckets numbered one two and three. How many ways are there to put 3 blocks in the first bucket, 2 blocks in the second bucket, and 2 blocks in the third bucket?

44. How many ways are there to make a 4 card hand which contains two pair but not four of a kind?

45. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $Var(X)$, the variance of X?

46. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is the mean of X^2?

47. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $Cov(X, Y)$, the covariance of X and Y?

48. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $E(XY)$, the mean of XY?

49. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is the value of D_X, the deviation of X, if we are given that the value of X is 85?

50. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $E(D_X^2)$, the expected squared deviation of X from its mean?

51. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is the value of Z_X, the standardization of X, if we are given that the value of X is 84?

52. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we think the value of D_Y, deviation of Y, is 16, then what should we think is the value of Y?

53. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $E(Y|D_Y = 16)$?

54. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we think the value of Z_Y, the standardization of Y, is 2, then what should we think is the value of D_Y, the deviation of Y?

55. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we think that Z_Y has value 2, then what should we think is the value of Y,?

56. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $E(Y|Z_Y = 2)$?

57. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we are given that $Z_X = 4$, then what should we guess for the value of Z_Y, that is, what is $E(Z_Y|Z_X = 4)$?

58. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we are told that the value of X is exactly the mean, which is 70, then what should we guess is the value of Y, that is, what is $E(Y|X = 70)$?

59. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we are given that $X = 98$, then what should we guess for the value of Y, that is, what is $E(Y|X = 98)$?

60. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If you guess that Y has value 119.2 when you know that $X = 98$, then what is your expected squared error?

61. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. If we guess the value of Y without using the value of X, then what is our expected squared error?

62. Suppose that X and Y are unknowns and that we know the regression slope is $\beta = 5$ for the regression line equation. Suppose that we also know that if X has value 60 then the regression equation tells us to guess 90 for the value of Y. If we are given that $X = 62$, then what should we guess for Y?

63. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $Var(X + Y)$, the variance of $X + Y$?

64. Suppose that X and Y are unknowns and that $E(X) = \mu_X = 70$, that $E(Y) = \mu_Y = 100$, that $\sigma_X = 7$, that $\sigma_Y = 8$, and that the correlation between X and Y is $\rho = .6$. What is $Var(X - Y)$, the variance of $X - Y$?

65. Suppose that a pond contains 50 fish of which 30 are redfish. If we catch 10 without replacement forming a simple random sample of fish in the pond, what is the probability that the number of redfish we find in our sample is exactly 7?

66. Suppose that a pond contains 50 fish of which 30 are redfish. If we catch 10 **with** replacement, throwing the fish back after each catch so as to form an independent random sample, then what is the probability that exactly 7 of the 10 fish caught will be redfish?

67. Suppose that a pond contains 50 fish of which 30 are redfish. If we catch 10 **with** replacement, throwing the fish back after each catch so as to form an independent random sample, then what is the probability that no more than 7 of the 10 fish caught will be redfish?

68. Suppose that our pond on average contains 20 tadpoles per cubic foot of water. We have a bucket which holds 2.5 cubic feet of water. Assume that the number of tadpoles in disjoint regions of water in the pond are independent. How many tadpoles do we expect to find in a bucket full of pond water from our pond?

69. Suppose that our pond on average contains 20 tadpoles per cubic foot of water. We have a bucket which holds 2.5 cubic feet of water. Assume that the number of tadpoles in disjoint regions of water in the pond are independent. What is the probability that a bucket full of our pond water contains exactly 47 tadpoles?

70. Suppose that our pond on average contains 20 tadpoles per cubic foot of water. We have a bucket which holds 2.5 cubic feet of water. Assume that the number of tadpoles in disjoint regions of water in the pond are independent. What is the probability that a bucket full of our pond water no more than 47 tadpoles?

71. Suppose that the fish in my pond have mean length 20 inches with a standard deviation of 4 inches, and that we know nothing else about the distribution of lengths for this population of fish. What is the probability that a fish caught from this pond will be over 20 inches in length?

72. Suppose that the fish in my pond have mean length 20 inches with a standard deviation of 4 inches, and that we know nothing else about the distribution of lengths for this population of fish. What is the probability that a fish caught from this pond will be between 22 and 27 inches in length?

73. Suppose that the fish in my pond have mean length 20 inches with a standard deviation of 4 inches, and that we know nothing else about the distribution of lengths for this population of fish. What is the probability that an independent random sample of 5 fish caught from this pond will average between 19 and 23 inches in length?

74 Suppose that the fish in my pond have mean length 20 inches with a standard deviation of 4 inches, and that we know nothing else about the distribution of lengths for this population of fish. What is the probability that in an independent random sample, the total length of 5 fish caught from this pond will be between 95 and 110 inches in length?

75. Suppose that buses arrive at my bus stop at an average rate of 3 per hour, which is the same as one every twenty minutes on average. Let W be the time I have to wait at my bus stop for a bus. What is the probability that I must wait more than 25 minutes for a bus? Assume that the number of buses arriving during disjoint time intervals are independent.

76. Suppose that the fish in my pond have mean length 20 inches with a standard deviation of 4 inches, and that we know nothing else about the distribution of lengths for this population of fish. What is the shortest a fish can possibly be and still be in the top 20 percent of fish as regards length?

77. Suppose that I do not know the mean weight of the fish in my pond and I want to estimate it using the sample mean of an independent random sample. Suppose that I have a sample of 36 fish with sample mean $\bar{x} = 8.3$ pounds. Suppose that I know that the standard deviation in fish weight for the fish in my pond is 2 pounds. What is the margin of error in the 95 percent confidence interval for the true mean weight of the fish in my pond?

78. Suppose that I do not know the mean weight of the fish in my pond and I want to estimate it using the sample mean of an independent random sample. Suppose that I have a sample of 36 fish with sample mean $\bar{x} = 8.3$ pounds. Suppose that I do not know the standard deviation in the weight of fish in my pond, but the sample standard deviation of my sample is 2 pounds. What is the margin of error in the 95 percent confidence interval for the true mean weight of the fish in my pond?

79. Suppose that I do not know the percentage of ducks that will vote for Donald for Mayor of Duckburg in an upcoming election. Suppose that in a simple random sample of 2000 citizens asked, 1078 say they will vote for Donald in the election. What is the 95 percent confidence interval for the true proportion of citzens of Duckburg who say they will vote for Donald in the upcoming election?

80. Suppose that I do not know the mean weight of the fish in my pond and I want to estimate it using the sample mean of an independent random sample. Suppose that I have a sample of 36 fish with sample mean $\bar{x} = 8.3$ pounds. Suppose that I know that the standard deviation in fish weight for the fish in my pond is 2 pounds. What is the significance of this data as evidence that the true mean weight of the fish in my pond actually exceeds 7.5 pounds?

81. Suppose that I do not know the mean weight of the fish in my pond and I want to estimate it using the sample mean of an independent random sample. Suppose that I have a sample of 36 fish with sample mean $\bar{x} = 8.3$ pounds. Suppose that I do not know the standard deviation in the weight of fish in my pond, but the sample standard deviation of my sample is 2 pounds. What is the significance of this data as evidence that the true mean weight of the fish in my pond actually exceeds 7.5 pounds?

82. Suppose that I do not know the percentage of ducks that will vote for Donald for Mayor of Duckburg in an upcoming election. Suppose that in a simple random sample of 2000 citizens asked, 1078 say they will vote for Donald in the election. What is the significance of this data as evidence that the true proportion of citzens of Duckburg who say they will vote for Donald in the upcoming election actually exceeds .51?

83. Suppose that I do not know the percentage of mice who support Goofy for Mayor of Duckburg but I have asked 10 mice and 7 say they support Goofy for Mayor of Duckburg whereas three support other candidates. What is the significance of this as evidence that the true proportion of mice who support Goofy for Mayor of Duckburg exceeds sixty percent?

84. Suppose that I want to make a 95 percent confidence interval for the true mean length of fish in my pond and I know that the length of fish in my pond is normally distributed with a standard deviation of at most $B = 8$ inches. What is the minimum size of an independent random sample from the population of fish in my pond required in order that the margin of error in my confidence interval be at most .25 inches?

85. Suppose that I want to make a 95 percent confidence interval for the true proportion of fish in my pond that are redfish. I want the margin of error to be at most .02. What is the miminum size of an independent random sample that will accomplish this.

86. Suppose that K and M are statements and that $P(K\&M) = .4$, and $P(M) = .7$. What is $P(K|M)$?

87. Suppose that K and M are statements and that $P(K\&M) = .4$, $P(K) = .8$, and $P(M) = .7$. What is $P(M|K)$?

88. Suppose that K and M are statements and that $P(K|M) = 4/7$, $P(K) = .8$, and $P(M) = .7$. What is $P(M|K)$?

89. Suppose that K and M are statements and that $P(K|M) = .3$, $P(K|\text{not } M) = .8$, and $P(M) = .4$. What is $P(K)$?

90. Suppose that K and M are statements and that $P(K|M) = .3$, $P(K|\text{not } M) = .8$, and $P(M) = .4$. What is $P(M|K)$?

91. Suppose that K, L, M, N are statements, that exactly one of the three statements L, M, N is true, and that

$$P(K|L) = .7, \ P(K|M) = .4, \ P(K|N) = .6, \ P(L) = .3, \ P(M) = .5, \ P(N) = .2.$$

Find $P(K)$.

92. Suppose that K, L, M, N are statements, that exactly one of the three statements L, M, N is true, and that

$$P(K|L) = .7, \ P(K|M) = .4, \ P(K|N) = .6, \ P(L) = .3, \ P(M) = .5, \ P(N) = .2.$$

Find $P(L|K)$.

93. Suppose that K, L, M, N are statements, that exactly one of the three statements L, M, N is true, and that

$$P(K|L) = .7, \ P(K|M) = .4, \ P(K|N) = .6, \ P(L) = .3, \ P(M) = .5, \ P(N) = .2.$$

Find $P(M|K)$.

94. Suppose that K, L, M, N are statements, that exactly one of the three statements L, M, N is true, and that

$$P(K|L) = .7, \ P(K|M) = .4, \ P(K|N) = .6, \ P(L) = .3, \ P(M) = .5, \ P(N) = .2.$$

Find $P(N|K)$.

95. Suppose that Sam is taking a multiple choice test to get his driving license renewed. Each question has 5 possible answers to choose from and exactly one answer is correct. Sam knows the correct answers to 70 percent of the questions, but he is not feeling well, and he only marks the questions he knows correctly 90 percent of the time. Of course, if he does not know, he just guesses by marking a random selection.
What is the probability that Sam marks a question correctly?

96. Suppose that Sam is taking a multiple choice test to get his driving license renewed. Each question has 5 possible answers to choose from and exactly one answer is correct. Sam knows the correct answers to 70 percent of the questions, but he is not feeling well, and he only marks the questions he knows correctly 90 percent of the time. Of course, if he does not know, he just guesses by marking a random selection.
(a) What is the probability that Sam knows the answer to a question he marks correctly?
(b) What is the probability that Sam does not know the answer to a question he marks incorrectly?

97. Ball Point Stylus Pen Limited, LLC (BPSPLLLC), has three factories, one is in Beijing, one is in Singapore, and one is in Rangoon. The Beijing factory produces 60 percent of the ball point pens produced by BPSPLLLC, the Singapore factor produces 25 percent of the ballpoint pens produced by BPSPLLLC, and the Rangoon factory produces the remaining 15 percent of the ball point pens produced by BPSPLLLC. The CEO of BPSPLLLC is concerned about defective ballpoint pens in the output. He knows that at the Beijing factory, 5 percent of the output is defective, at the Singapore factory 8 percent of the output is defective, and at the Rangoon factory, 10 percent of the output is defective.
What is the overall percentage of defective ballpoint pens produced by BPSPLLLC, that is, what is the probability that a ballpoint pen is defective, given the only thing we know is that it was produced by BPSPLLLC.

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Given that a BPSPLLLC ballpoint pen is defective, what is the chance it was produced in the Beijing factory?

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point pens produced by BPSPLLLC, the Singapore factor produces 25 percent of the ballpoint pens produced by BPSPLLLC, and the Rangoon factory produces the remaining 15 percent of the ball point pens produced by BPSPLLLC. The CEO of BPSPLLLC is concerned about defective ballpoint pens in the output. He knows that at the Beijing factory, 5 percent of the output is defective, at the Singapore factory 8 percent of the output is defective, and at the Rangoon factory, 10 percent of the output is defective.

Given that a BPSPLLLC ballpoint pen is defective, what is the chance it was produced in the Singapore factory?

100. Ball Point Stylus Pen Limited, LLC (BPSPLLLC), has three factories, one is in Beijing, one is in Singapore, and one is in Rangoon. The Beijing factory produces 60 percent of the ball point pens produced by BPSPLLLC, the Singapore factor produces 25 percent of the ballpoint pens produced by BPSPLLLC, and the Rangoon factory produces the remaining 15 percent of the ball point pens produced by BPSPLLLC. The CEO of BPSPLLLC is concerned about defective ballpoint pens in the output. He knows that at the Beijing factory, 5 percent of the output is defective, at the Singapore factory 8 percent of the output is defective, and at the Rangoon factory, 10 percent of the output is defective.

Given that a BPSPLLLC ballpoint pen is defective, what is the chance it was produced in the Rangoon factory?