Math 115 (Powers) 1½ Hour Test. Thursday October 22, 2009

1. Two fair die numbered 1-6 are tossed. What is the probability that the maximum number showing is 3 or less? Ans =

   A. 1/3 B. 1/2 C. 4/9 D. 17/36 E. 7/9 F. 11/36 G. 1/9 H. ##1/4

2. A man has two red socks, two green socks and two blue socks in a box above his head. He randomly selects three socks. What is the probability he has two socks the same color?

   A. 1 B. 1/2 C. 1/4 D. 1/5 E. 3/5 ## F. 4/5 G. 3/11 H. 3/7

3. Three fair die numbered 1-6 are rolled. What is the probability that no digit is repeated (i.e. the numbers on all the die are different).

   A. 5/9 ## B. 7/18 C. 1/3 D. 5/18 E. 2/3 F. 13/17 G. 1/2

4. Suppose A, B and C are independent events and Pr(A) = 1/2, Pr(B) = 1/3 and Pr(C) = 1/5. What is the probability that exactly one of these events will occur? Probability of exactly one event =

   A. 1/15 B. 1/5 C. 1/3 D. 2/5 E. 7/15 ## F. 8/15 G. 3/5 H. 2/3

5. A two sided coin A has a 2/3 probability of landing heads and a two sided coin B has a 1/3 probability of landing heads. Each coin is flipped twice. What is the probability that A produces more heads than B?

   A. $\frac{18}{81} = \frac{2}{9}$ B. $\frac{22}{81}$ C. $\frac{39}{81} = \frac{13}{27}$ D. $\frac{44}{81}$ E. $\frac{48}{81} = \frac{16}{27}$ ## F. $\frac{56}{81}$ G. $\frac{64}{81}$ H. $\frac{70}{81}$

6. A jar contains 6 red balls and 4 green balls. If 3 balls are randonly drawn out of the jar without replacement. What is the probability that there are more red balls than green balls.

   A. $\frac{1}{8}$ B. $\frac{1}{6}$ C. $\frac{1}{4}$ D. $\frac{1}{3}$ E. $\frac{3}{8}$ F. $\frac{3}{5}$ G. ## $\frac{2}{3}$ H. $\frac{3}{4}$

7. Three fair independent die A,B and C numbered (1,2,3,4,5,6) are tossed. It is know that the sum is 8. What is the expected value of die A. (Hint list the ways the sum can be 5.)

   A. 3 B. $\frac{5}{2}$ C. 2 D. $\frac{5}{3}$ ## E. $\frac{4}{3}$ F. $\frac{8}{7}$ G. 1 H. $\frac{4}{5}$

8. Suppose A and B are two events in a sample space and Prob(A) = $\frac{1}{2}$ Prob(B) = $\frac{1}{3}$ and the conditional probability of A given B is Prob(A | B) = $\frac{1}{4}$. What is the probability that neither A or B occurs?. $\text{Prob}(A^C \cap B^C) = \text{Prob}((A \cup B)^C) =$

   A. $\frac{1}{8}$ B. $\frac{1}{6}$ C. $\frac{1}{4}$ ## D. $\frac{1}{3}$ E. $\frac{3}{8}$ F. $\frac{5}{12}$ G. $\frac{2}{3}$ H. $\frac{3}{4}$

9. There are three coins A, B and C. Coin A has lands heads 1/4 of the time, coin B lands heads 1/2 of the time and coin C lands heads 3/4 of the time. A coin is selected at random and is flipped three times. It produces two heads and a tails. Which coin is it most likely to be and what is the probalbility it is that coin?

   cirle most probable coin A. B. C.##

   Probability coin lands heads 1/4 1/2 3/4

   Probability most probable coin is choosen. 50% 45%## 40% 36% 30% 25%

10. Six cards marked with the letters, A, A, A, B, B and C are in a box. The cards are drawn out one at a time. What is the probability the cards are drawn out in alphabetical order?

    A. 1/2 B. 1/4 C. 1/10 D. 1/25 E. 1/60## F. 1/120 G. 3/131 H. 1/260

11. In the world series of foosball, a three-game match is played, and the player who wins the most games is the champion. The probability of Player A winning any given game against Player B is always 3/5. What is the probability that Player A will be the champion? (You may assume all three games are played even if one player wins three of the first four games.

A. $\frac{100}{125} = \frac{4}{5}$ B. $\frac{95}{125} = \frac{19}{25}$ C.## $\frac{81}{125}$ D. $\frac{75}{125} = \frac{3}{5}$ E. $\frac{69}{125}$ F. $\frac{63}{125}$ G. $\frac{1}{2}$ H. $\frac{3}{7}$

12. Evaluate $\int_1^2 \int_{\sqrt{y-1}}^1 e^{x^3}\,dx\,dy$

A. 0 B. e C. $\frac{e-1}{8}$ D. $\frac{1}{2}(e^2 - 1)$ E. $4\ln(2) - 1$ F. $e - 2$ G. $\frac{(e-1)}{3}$## H. 4

13. Find the shortest distance S and the longest distance L from the piont (x = 0, y = 1) to the elipse $4x^2 + y^2 = 4$. (Shortest, Longest) = (S,L) =

A.(1,3) B.($\sqrt{2}$,4) C.($\sqrt{2/3}$,3)## D.($\sqrt{1/2}$,2) E.(2,3) F.($1\frac{1}{2}$,$3\frac{1}{2}$) G.($\sqrt{1/3}$,$\sqrt{2}$) H.(2,2)