Math 1320

Quiz

Name:_____ID#:_____

Instructions: Solve the following problems. Show all your work in order to get full credit.

Problem 1. The following table, which shows the profile, by Math SAT I scores, of admitted students at UCLA for the Fall 2004 semester

	200-399	400-499	500-599	600-699	700-799	Total
Admitted	7	212	1124	2882	5309	9534
Not Admitted	687	3512	8689	12230	5150	30268
Total Applicants	694	3724	9813	15112	10459	39802

Compute the theoretical probabilities of the following events:

a. (3 points) An applicant was admitted.

Solution: $\dfrac{9534}{39802} = \dfrac{681}{2843} \approx 0.2395 \approx 23.95\%$

b. (4 points) An applicant had a Math SAT below 500 and was admitted.

Solution: $\dfrac{7 + 212}{39802} = \dfrac{219}{39802} \approx 0.0055 \approx 0.55\%$

c. (4 points) An admitted student had a Math SAT of 600 or above.

Solution: $\dfrac{2882 + 5309}{9534} = \dfrac{8191}{9534} \approx 0.8591 \approx 85.91\%$

d. (4 points) A rejected applicant had a Math SAT below 600.

Solution: $\dfrac{687 + 3512 + 8689}{30268} = \dfrac{12888}{30268} = \dfrac{3222}{7567} \approx 0.4258 \approx 42.58\%$

Problem 2. Use the given information to find the indicated probability.

a. $P(A) = .1$, $P(B) = .6$, $P(A \cap B) = .05$. Find $P(A \cup B)$.
Solution: $P(A \cup B) = P(A) + P(B) - P(A \cap B) = 0.1 + 0.6 - 0.05 = 0.65$

b. A and B are mutually exclusive. $P(A) = .4$, $P(B) = .4$. Find $P((A \cup B)')$.
Solution: $P((A \cup B)') = 1 - P(A \cup B) = 1 - (0.4 + 0.4 - 0) = 0.2$

c. $A \cup B = S$ and $A \cap B = \varnothing$. Find $P(A) + P(B)$.
Solution: Since $A \cap B = \varnothing$, then $P(A) + P(B) = P(A \cup B) = P(S) = 1$

d. $P(A \cup B) = .3$ and $P(A \cap B) = .1$. Find $P(A) + P(B)$
Solution: $P(A) + P(B) = P(A \cup B) + P(A \cap B) = 0.3 + 0.1 = 0.4$