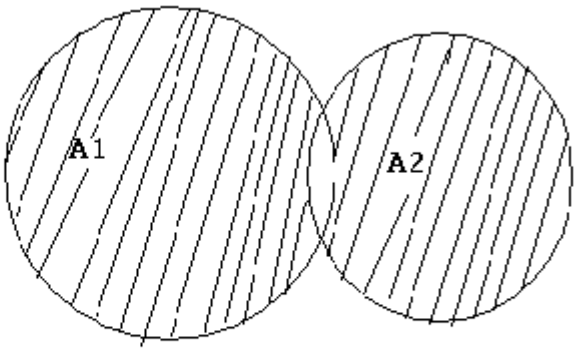
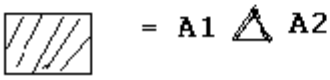
MATH 662-101 FALL 2003

Page 52, #1.3.8, Probability and Statistical Inference by Nitis Mukhopadhyay, 2000.





Please note that $P(A_1 \cup A_2) = P(A_1) + P(A_2) - P(A_1 \cap A_2)$ from additive law of probability, i.e., Theorem 1.3.1 (iv) from page 7. From diagram above (also page 4 of the textbook) please note that $\left[A_1 \Delta A_2\right] \cup (A_1 \cap A_2) = A_1 \cup A_2$. Thus, $P\left[A_1 \Delta A_2\right] + P(A_1 \cap A_2) = P(A_1 \cup A_2)$ now use the above formula for $P(A_1 \cup A_2)$ to give $P\left[A_1 \Delta A_2\right] + P(A_1 \cap A_2) = P(A_1) + P(A_2) - P(A_1 \cap A_2)$, solving for the probability of the symmetric difference set give the desired result.

1.4.6 page 53, Probability and Statistical Inference by Nitis Mukhopadhyay, 2000.

The sample space consists of 52C4 distinct outcomes.

In (ii) we want ace, king, queen and jack all of clubs so there is only one outcome namely, (A♣, K♣,Q♣, J♣). Hence the probability is 1/52C4 = 1/270,725 = 0.000,003,6937852.

In (iii) the event has four outcomes (A♣, K♣,Q♣, J♣), (A♢, K♢,Q♢, J♢), (A♡, K♡,Q♡, J ♡) and (A♠, K♠,Q♠, J♠). Hence the answer is 4/52C4 =4/270,725 = 0.000,014,7751408.

In (iv) the event is a simple event with only one outcome as in (ii) namely (Q♣, Q♢, Q♡, Q♠), hence the answer is the same as in (ii) namely, 0.000,003,6937852.