1. Is it possible that an event is independent of itself? If so, when?

Solution: Let A be an event, IF A is independent of itself then P(A) = P(AnA) = P(A)^2,

so P(A) is 0 or 1 So this is only possible in the extreme cases that the event has

probability 0 or 1.

1. Is it always true that if A and B are independent events, then A^c and B^c are independent events? Show that it is, or give a counterexample.

Yes, because we have P(A^c \ B^c )=1- P(A U B)=1- (P(A) + P(B) -P(A n B));

since A and B are independent, this becomes

1 - P(A) - P(B) + P(A)P(B) = (1- P(A))(1- P(B)) = P(A^c )P(B^c ).