1.

We throw two dice. Let A be the event “the sum of the points is 7”, B the event “die #1

came up 3”, and C the event “die #2 came up 4”. Now, P[A] = P[B] = P[C] = 1/6.

Also,

P[A ∩ B] = P[A ∩ C] = P[B ∩ C] = 1/36

so that all events are pairwise independent. However,

P[A ∩ B ∩ C] = P[B ∩ C] = 1/36

while

P[A]P[B]P[C] = 1/216

so they are not independent as a triplet.

First, note that, indeed, P[A ∩ B] = P[B ∩ C] = 1/36, since the fact that A and B occurred is the same as the fact that B and C occurred.

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