Math 153 - Quiz 7

October 20, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) A number of adults were asked about a stand-up comedy performance they attended.

	Thought show was very funny	Did not think show was very funny
Older than 30 years old	32	72
30 years old or younger	56	126

One of the survey participants is selected at random.

(a) What is the probability that the person is older than 30 or thought the show was very funny?

$$\frac{32+72+56}{32+72+56+126} = \frac{160}{286} \approx 56\%$$

(b) What is the probability that the person thought the show was very funny given that the person is older than 30?

$$\frac{32}{32+72} = \frac{32}{104} \approx 31\%$$

(c) Are the show attendees attitudes about the "funniness" of the show independent of age?

$$\text{PROB}(\text{VERY FUNNY} \mid \text{OLDER THAN 30}) = \frac{32}{104} \quad (\text{PART (b)})$$

$$\text{PROB}(\text{VERY FUNNY}) = \frac{32+56}{286} = \frac{88}{286}$$

} EQUAL! BOTH REDUCE TO $\frac{4}{13}$

2. (4 points) Suppose A and B are events such that $P(A) = 0.28$, $P(B) = 0.36$, and $P(A \cup B) = 0.50$. Find $P(B|A)$. Are A and B independent?

$$P(A \cap B) = 0.28 + 0.36 - 0.50 = 0.14$$

$$P(B|A) = \frac{0.14}{0.28} = 0.50 \neq P(B)$$

A AND B ARE NOT INDEPENDENT.