

Name: Key

Note: Quiz 1-D questions are the same just in a different order.

Quiz 1-B/D

Math 345 Elementary Statistics – Crawford

14 February 2018

Books and notes (in any form) are not allowed. Show your set-up and work. Good Luck!

1. (5 pts) The following table summarizes data about head injuries in alpine skiers and snowboarders (based on data from the Journal of the American Medical Association).

		Head Injuries?	
		Yes	No
Wore Helmet?	Yes	96	656
	No	480	2330

(a). If one of the subjects is randomly selected, find the probability of selecting someone who did not have head injuries, given that the subject did not wear a helmet.

$$480 + 2330 = 2810$$

$$P(NI | NH) = \frac{2330}{2810} \approx 0.829$$

(b). If one of the subjects is randomly selected, find the probability of selecting someone who had head injuries, given that the subject wore a helmet.

$$96 + 656 = 752$$

$$P(I | H) = \frac{96}{752} \approx 0.128$$

2. (2 pts) How many different arrangements of the letters in NIAGARA FALLS are there?

$$\frac{12!}{4! 2!} = 9979,200$$

↑
A's

3. (4 pts) The probability that a Tuff-n-Tread tire is defective is 0.0003. If 6 of these tires are used on one military tank, what is the probability that at least one of them is defective?

$$\begin{aligned}
 P(\text{At least 1 Defective}) &= 1 - P(\text{None Defective}) \\
 &= 1 - P(\text{All Good}) \\
 &= 1 - (.9997)^6 \approx \boxed{.00180}
 \end{aligned}$$

$$P(\text{Good}) = 1 - .0003 = .9997$$

4. (4 pts) Dr. Crawford collects 18 homework problems. She randomly selects 2 problems to grade.

- (a). How many possible different groups of 2 problems could she choose?

order doesn't matter \Rightarrow Combination

$$18 C_2 = \boxed{153} \text{ from calculator nCr option}$$

$$\begin{aligned}
 \text{UTZ } 18 C_2 &= \frac{18!}{16! 2!} = \frac{18 \cdot 17 \cdot \cancel{16!}}{\cancel{16!} 2!} = \frac{18 \cdot 17}{2 \cdot 1} = 153
 \end{aligned}$$

- (b). You did not do exactly 2 problems in the homework. What is the probability that the 2 she randomly picked are the same 2 you did not do?

$$P(\text{Both Same}) = \frac{1}{153} \approx \boxed{0.00654}$$