Math 153 - Quiz 6

Name **key**

October 5, 2017

Score _____

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

1. (5 points) A teacher collected the following data on her students.

	Completed assignments	Did not complete assignments	
Passed class	217	59	276
Failed class	18	67	85
	235	186	361

One of those students is selected at random.

(a) What is the probability that the student completed assignments?

$$\frac{217 + 18}{361} = \boxed{\frac{235}{361}}$$

(b) What is the probability that the student passed the class?

$$\frac{217 + 59}{361} = \boxed{\frac{276}{361}}$$

(c) What is the probability that the student completed assignments or passed the class?

$$\frac{217 + 18 + 59}{361} = \boxed{\frac{294}{361}}$$

(d) What is the probability that the student completed assignments and passed the class?

$$\boxed{\frac{217}{361}}$$

(e) Explain why the answer in part (c) is not the sum of the answers in parts (a) and (b).

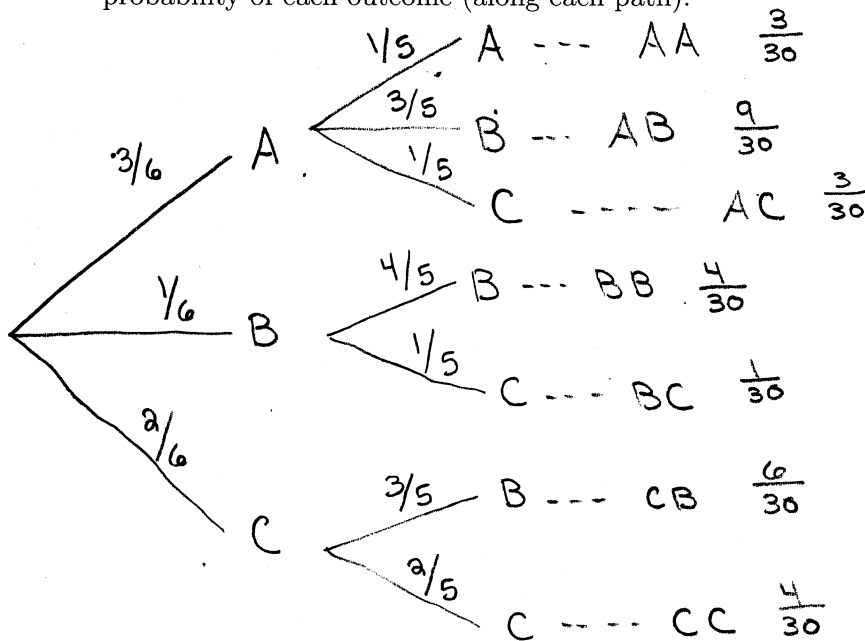IF WE SIMPLY ADD (a) & (b), THE OVERLAP (217) IS COUNTED TWICE.

IT SHOULD ONLY BE COUNTED ONCE, AS IN (c).

2. (5 points) A letter is selected at random from the first box and placed into the second box. Then a letter is selected from the second box.

$$\boxed{A\,A\,A\,B\,C\,C}\qquad\qquad\boxed{B\,B\,B\,C}$$

(a) Sketch the probability tree associated with this two-stage experiment and find the probability of each outcome (along each path).

$$3/6 \quad A \begin{cases} 1/5 & A \text{ --- } AA \quad \frac{3}{30} \\ 3/5 & B \text{ --- } AB \quad \frac{9}{30} \\ 1/5 & C \text{ ---- } AC \quad \frac{3}{30} \end{cases}$$

$$1/6 \quad B \begin{cases} 4/5 & B \text{ --- } BB \quad \frac{4}{30} \\ 1/5 & C \text{ --- } BC \quad \frac{1}{30} \end{cases}$$

$$2/6 \quad C \begin{cases} 3/5 & B \text{ --- } CB \quad \frac{6}{30} \\ 2/5 & C \text{ ---- } CC \quad \frac{4}{30} \end{cases}$$

(b) What is the probability of selecting the letter C from the second box?

$$\frac{3}{30} + \frac{1}{30} + \frac{4}{30} = \boxed{\frac{8}{30}}$$

(c) What are the **odds against** selecting a C from the second box?

From (b), ODDS IN FAVOR ARE $\frac{8}{22}$.

$\Rightarrow$ ODDS AGAINST ARE $\boxed{\frac{22}{8} \text{ OR } \frac{11}{4}}$