Quiz 5.3B AP Statistics Name:

1. What age groups use social networking sites? A recent study produced the following data about 768 individuals who were asked their age and which of three social networking sites they used most often. (People who did not use such sites were excluded from the study).

	Age Group (Years)				
Web site	0 – 24	25 – 44	45 – 64	Over 65	Totals
Facebook	77	105	114	12	308
Twitter	46	110	81	7	244
LinkedIn	15	97	95	9	216
Totals	138	312	290	28	768

Suppose one subject from this study was selected at random.

(a) Find the probability that the selected subject preferred Twitter.

(b) Find the probability that the selected subject preferred Twitter, given that he or she was in the 45 – 64 age group.

(c) Are the events "preferred Twitter" and "age group 45 – 64" independent? Explain.

(d) Are the events "preferred Twitter" and "age group 45 – 64" mutually exclusive? Explain.

(e) If a random sample of two subjects were selected, what is the probability that neither preferred Twitter?

2. Some days, Ramon drives to work. The rest of the time he rides his bike. Suppose we choose a random work day. The following table gives the probabilities of several events.

Event	Probability
Drives to work	0.20
Drives and is late for work	0.05
Late for work, given he bikes	0.30

(a) Find the probability that Ramon is late for work, given that he drives.

(b) Find the probability that Ramon is not late for work, given that he drives.

(c) Draw a tree diagram to summarize the given probabilities and those you determined above.

(d) Find the probability that Ramon drove to work, given that he is late.

Quiz 5.3A

1. (a) $P(C) = \frac{24}{94} \approx 0.255$ (b) $P(C \mid F) = \frac{13}{36} \approx 0.361$

(c) No, From parts (a) and (b), $P(C \mid F) \neq P(C)$

(d) No. The occurrence of one event does not preclude the occurrence of the other; it's possible that a subject prefers Brand C and is also female. That is $P(C \cap F) \neq 0$.

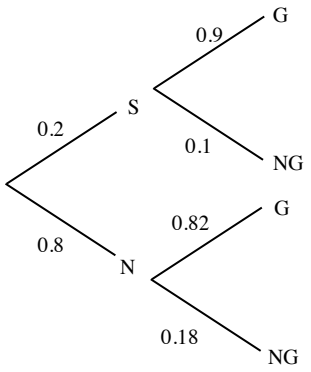
(e) 68 subjects did not prefer brand A, so $P(A^C \cap A^C) = \frac{68}{94} \cdot \frac{67}{93} \approx 0.521$

2. See tree diagram for event names.

(a) $P(G \mid S) = \frac{P(S \cap G)}{P(S)} = \frac{0.18}{0.20} = 0.9$

(b) $P(NG \mid S) = 1 - P(G \mid S) = 1 - 0.9 = 0.1$ (c) Tree diagram at right.

(d) $P(N \mid G) = \frac{P(N \cap G)}{P(G)} = \frac{(0.8 \times 0.82)}{(0.8 \times 0.82) + (0.2 \times 0.9)} \approx 0.785$



Quiz 5.3B

1. (a) $P(\text{Twitter}) = \frac{244}{768} \approx 0.318$ (b) $P(\text{Twitter} \mid 45\text{-}64) = \frac{81}{290} \approx 0.279$

(c) No. From parts (a) and (b), $P(\text{Twitter} \mid 45-64) \neq P(\text{Twitter})$

(d) No. The occurrence of one event does not preclude the occurrence of the other; it's possible that a subject preferred Twitter and is also in the 45 – 64 age group. That is, $P(\text{Twitter} \cap 45-64) \neq 0$

(e) 524 subjects did not prefer Twitter, so

$P(\text{Not Twitter} \cap \text{Not Twitter}) = \frac{524}{768} \cdot \frac{523}{767} \approx 0.465$

2. See tree diagram for event names. (a) $P(L \mid D) = \frac{.05}{.20} = 0.25$

(b) $P(NL \mid D) = 1 - P(L \mid D) = 1 - 0.25 = 0.75$

(c) Tree diagram at right. (d) $P(D \mid L) = \frac{P(D \cap L)}{P(L)} = \frac{(.2 \times .25)}{(.2 \times .25) + (.8 \times .3)} \approx 0.172$