$\boxed{5.3}$ #'s 63, 65, 67, 69, 71

(63) (A) P(almost certain given male) =

$$\frac{P(A \cap B)}{P(B)} = \frac{P(\text{almost certain and male})}{P(\text{male})} = \frac{597}{2459}$$

Formula on Green Sheet

$= .2428$ or about 24.3%

(B) P(Female | some chance but probably not) $= \frac{P(\text{Female and Some Chance})}{P(\text{some chance})} = \frac{426}{712}$

$= .5983$ or about 59.8%

(65) (a) P(a Good chance | female) $= \frac{663}{2367} = .2801$

(b) P(a good chance) $= \frac{1421}{4826} = .2944$

(c) The events "a good chance" and female are NOT independent, since the two probabilities are NOT EQUAL $.2801 \neq .2944$.

(67) (a) $P(D|F) = \frac{P(D \text{ and } F)}{P(F)} = \frac{13}{13+4} = \frac{13}{17} = .7647$

This means that approximately 76% OF THE FEMALES ARE Democrats

(b) $P(F|D) = \frac{P(D \text{ and } F)}{P(D)} = \frac{13}{47+13} = \frac{13}{60} = .2167$

This means approximately 22% of the democrats are female

$\boxed{5.3}$

(69) $P(D) = \frac{47+13}{100} = \frac{60}{100} = .60 \neq P(D|F) = .7647$ (from #67)

Since these 2 probabilities are not the same, Democrat and Female are NOT independent.

(71) [A] P(is studying other than ENGLISH) = 1 − P(NONE)
= 1 − .59 = .41

[B] $P(\text{Spanish} \mid \text{other than ENGLISH}) = \frac{.26}{.41} = .6341$

5.3 75, 77, 79, 83, 85, 87, 91, 95, 99, 104-106

75 ROLL 2 6 SIDED DICE HAS 36 OUTCOMES

EVENTS: Sum is 7 and Green die is a 4

P(sum is 7) = (1, 6) (2, 5) (3, 4) (4, 3) (5, 2) (6, 1) $= \frac{6}{36} = \frac{1}{6}$

P(GREEN DIE SHOWS A 4) = (1, 4) (2, 4) (3, 4) (4, 4) (5, 4) (6, 4) $= \frac{6}{36}$

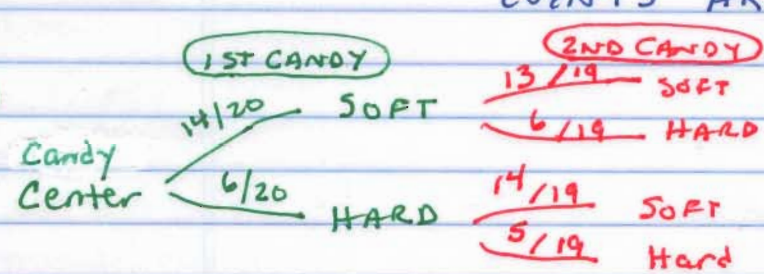
P(SUM 7 | GREEN 4) = 1/6

Therefore:

P(sum is 7) = P(sum 7 | GREEN 4)

1/6 = 1/6 ✓ since these are EQUAL THE EVENTS ARE INDEPENDENT.

77 (a)



(b) P(one soft ∩ one hard) $= \left(\frac{14}{20}\right)\left(\frac{6}{19}\right) + \left(\frac{6}{20}\right)\left(\frac{14}{19}\right) =$ .442

79 P(down load music) = .29

P(don't care | down load music) = .67

General multiplication Rule $P(A \cap B) = P(A) \cdot P(B|A)$
make sure you know how to get this formula on the green sheet

P(download music ∩ don't care) = P(download) · P(don't care | download)

= (.29)(.67) = .1943

5.3

(83) Notice: the problem gives conditional probabilities

Customer → .88 Regular → .28 credit $= (.88)(.28) = .2464$; .72 No CC $= .6336$

Customer → .02 Mid Grade → .34 credit $(.02)(.34) = .0068$; .66 no CC $=$ .0132

Customer → .10 Premium → .42 credit $(.10)(.42) = .0420$; .58 no CC $= .0580$

P(credit card) $= .2464 + .0068 + .0420 = .2952$

Conclusion (in context): About 29.5% of customers use their credit card to pay for their gas.

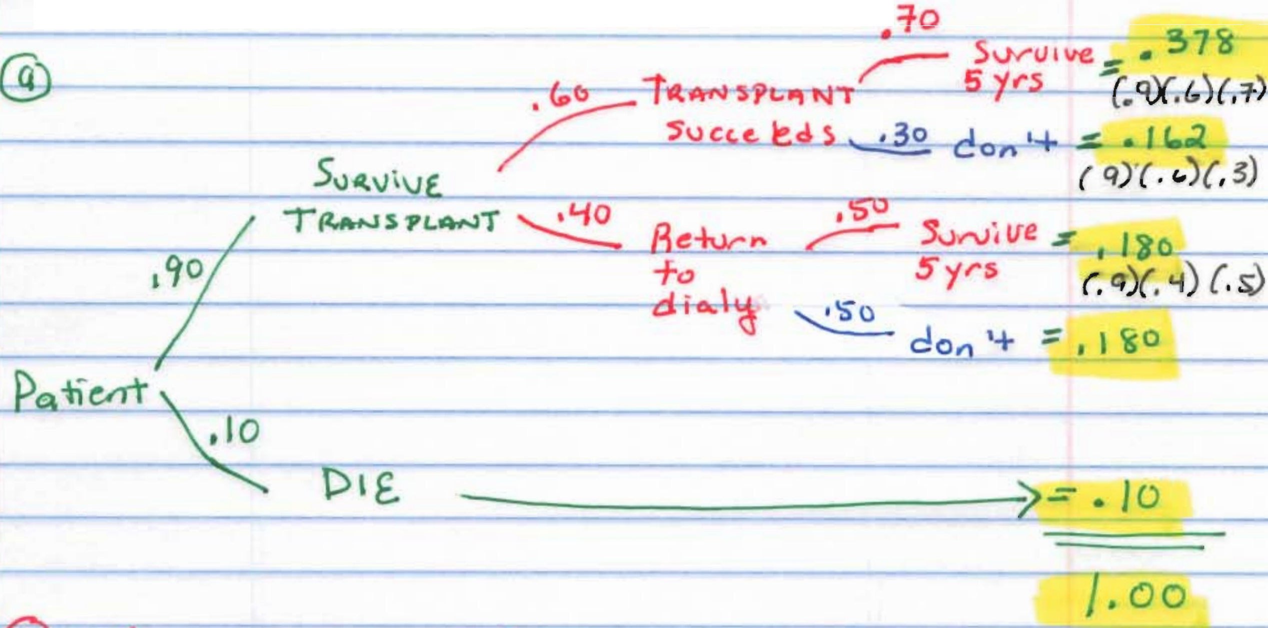
(85) $P(\text{Premium Gas} \mid \text{credit card}) = \dfrac{P(\text{premium gas} \cap \text{credit card})}{P(\text{credit card})}$

$= \dfrac{.0420}{.2952} = .1423$

about 14% bought premium gas given they paid with a credit card

5.3

87 a



b $P(\text{Survive 5 years}) = .378 + .180$

$= .558$

91 $P(\text{at least 1 universal donor}) = 1 - P(\text{none are universal donors})$

$1 - .474 = .526$

Known

$P(\text{O Negative}) = .072$

$P(\text{Not } O^-) = .928$

$P(\text{None are } O^- \text{ out 10}) = .928^{10} = .474$

Conclude: There is about a 53% chance that at least one of the 10 blood donors in a universal donor (O^-)

95 $P(\text{My Space} \mid \text{Facebook}) = \dfrac{P(FB \cap MS)}{P(FB)} = \dfrac{.42}{.85}$

$= .494$

Given

$P(FB) = .85$

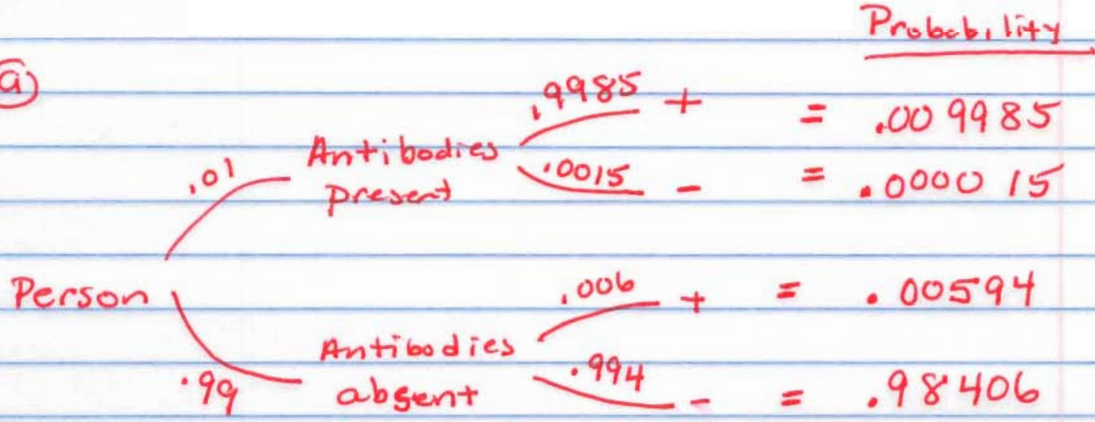
$P(MS) = .54$

$P(FB \cap MS) = .42$

AP Green Sheet: $P(B|A) = \dfrac{P(A \cap B)}{P(A)}$

5.3

(99) (a)



(b) P(POSITIVE TEST RESULT) = .009985 + .00594

= $\boxed{.015925}$

(c) $P(\text{ANTIBODY} \mid \text{POSITIVE}) = \dfrac{P(\text{antibody} \cap \text{positive})}{P(\text{positive})}$

$= \dfrac{.009985}{.015925} = .627$

(104) (c)

$\boxed{P(\text{Neither}) = .02}$

	A	NOT A	
B			.8 ← P(B)
NOT B		(.2)(.1) = .02	.2
	.9	.1	1.0
	↑ P(A)		

Events are independent so can multiply events

5.3

105 (e)

exam all 50 w/ food poisining
random sample 200 at conference who did NOT
have food poising
40% of 50 w/ food poising went to party
10% of conference attendees went to party

$\boxed{\text{Prob describe 40\% of people went to party}}$

A = attend party
F = food poisining

$\boxed{.40 = P(A \mid F)}$

None of the choices

106 (d)

$$P(1 \text{ Given ODD}) = \frac{P(1 \cap \text{ODD})}{P(\text{ODD})} = \frac{.3}{.3 + .1 + .1} = .6$$