5.2 HW #'s 39, 41, 45, 47, 49, 51, 53, 55, 57-60

(39)

$$S = \begin{cases} (1,1) \\ (1,2)\ (2,1) \\ (1,3)\ (2,2)\ (3,1) \\ (1,4)\ (2,3)\ (3,2)\ (4,1) \\ \quad\quad\ (2,4)\ (3,3)\ (4,2) \\ \quad\quad\quad\quad\ (3,4)\ (4,3) \\ \quad\quad\quad\quad\quad\quad\ (4,4) \end{cases}$$

(A) The sample Space is,

(B) There are 16 possible outcomes. EACH HAS A probability $= \frac{1}{16}$.

(41) DEFINE EVENT A = sum is 5

(There a 4 possible outcomes (1,4) (2,3) (3,2) (4,1))

$P(A) = 4/16 = 1/4$ OR $P(A) = .25$

(45)

BLOODTYPE	O	A	B	AB	TOTAL
PROBABILITY	.49	.27	.20	.04	1.00

(a) $P(AB) = 1 - .49 - .27 - .20 = 1 - .96 = .04$

a legitimate probability model has the sum of all possible outcome total to 1.

(b) $P(\text{NOT } AB) = 1 - .04 = .96$

(c) $P(O \text{ or } B) = P(\text{type } O) + P(\text{type } B) = .49 + .20 = .69$

5.2

(47)

EDUCATION	NO HS.	HS ONLY	BA+	OTHER	TOTAL
Probability	.13	.29	.30	.28	1.0

(a) FIND EDUCATION BEYOND HS BUT DID NOT RECEIVE BA. $1 - .13 - .29 - .30 = .28$

(b) P(at least a HS education) $= 1 - .13 = .87$
BASED ON THE COMPLEMENT RULE

(49) (a) The individuals are the students in the urban school
The variables measured are the Children's gender and whether or not THEY EAT breakfast.

(b) P(female) = $275/595 = .462$
P(eat breakfast regularly) = $300/595 = .504$
P(female and eat breakfast) = $110/595 = .185$
P(female or eat breakfast) = two options
OPTION 1 P(female) + P(eat breakfast) − P(female + break.)
$$= \frac{275}{595} + \frac{300}{595} - \frac{110}{595} = \frac{465}{595} = .782$$
OPTION 2 Add the individual cell counts
$$\frac{110 + 165 + 190}{595} = \frac{465}{595} = .782$$

5.2

(51) (A) DEFINE EVENTS B = Ball lands on a black slot
E = ball lands on an even slot

	BLACK	NOT BLACK	TOTAL
EVEN	10	10	20
NOT EVEN	8	10	18
TOTAL	18	20	38

18 BLACK — E 10, O 8
18 Red — E 8, O 10
2 Green — EVEN
COUNTS FROM WHEEL

(B) $P(B) = 18/38 = .474$
$P(E) = 20/38 = .526$

(C) The event "B and E" would be the ball lands in a black even spot

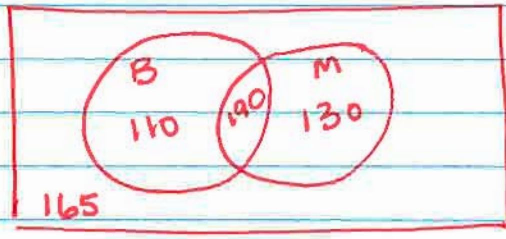
$P(B \text{ and } E) = 10/38 = .263$

(d) The event "B or E" would be that the ball lands in a black spot, or an even slot, or it could land on both a black and even slot.
Since the events are not mutually exclusive, we would double count the probabilities that land in a black, even spot. To find the probability

$$P(B \text{ or } E) = P(B) + P(E) - P(B \text{ and } E)$$
$$= \frac{18}{38} + \frac{20}{38} - \frac{10}{38} = \boxed{\frac{28}{38}} \text{ or } \boxed{.737}$$

5.2

(53) (a)



Events
B = EAT Breakfast
m = male

(b) $P(B \cup m) = P(B \text{ or } m) = \dfrac{110+190+130}{595} = \dfrac{430}{595}$ or $.723$

The probability of being either male, or eat breakfast, or a male that eats breakfast.

(c) $P(B^c \cap m^c) = P(B^c \text{ and } m^c) = \dfrac{165}{595} = .277$

The probability of a female who doesn't eat breakfast.
(that is neither male nor eat breakfast)

(55) (A)

(MILLIONS)	FACEBOOK		NOT FACEBOOK		TOTAL	
MYSPACE	.42	8.4 million	.12	2.4 million	.54	10.8 mill
NOT MYSPACE	.43	8.6	.03	.6 million	.46	9.2 mill
TOTAL	.85	17.0	.15	.3 million	1.0	20 million

STEP 1: FILL IN GIVEN %
STEP 2: THEN FILL IN OTHER %'s
STEP 3: MULT %'s by 20 million

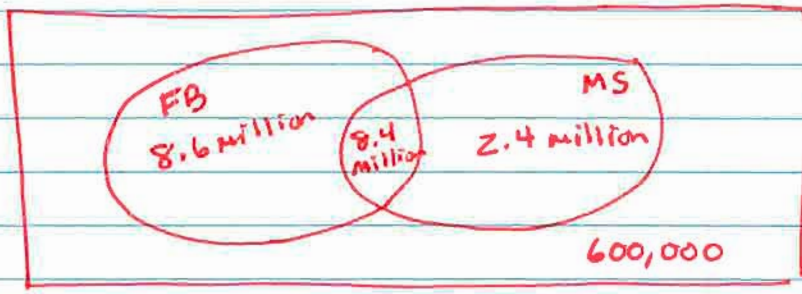
5.2

55 CONT B)

EVENTS:

FB = Face book

MS = My Space



(c + d) $P(FB \text{ or } MS) = P(FB \cup MS) = \frac{8.6 + 8.4 + 2.4}{20} = \frac{19.4}{20}$

Using the Venn diagram, add 8.6, 8.4, 2.4 to get 19.4 million students that use either Facebook, Myspace or both. About 97% use either or both.

$= .97$

57 C The given probabilities = .68

$1 - .68 = .32$ is the remaining probabilitie

therefore the probability must be .16

since same probability for 3 or 4

58 d $P(7) + P(8) + P(9) = 1/10 + 1/10 + 1/10 = 3/10$

59 C

Vegetarians	Fish	No Fish
EGGS	9	3
No EGGS		8
		20

P(Neither EGG or Fish) = 8/20 = .4

60 C $P(7) + P(11) = 6/36 + 2/36 = 8/36$