Homework #9

Section 9.1

Q 17.

a. $E_1 = \{RBB, BRB, BBR, YRY, RYY, YYR, RBY, BRY, YRB, YBR, BYR, RYB\}$

$N(E_1) = 12$ Total number of events are: $3 \times 3 \times 3 = 27$

$n(S) = 27$

$P(E_1) = \frac{N(E_1)}{N(S)} = \frac{12}{27} = \frac{4}{9}$

∴ The probability of the event that exactly one of the colors that appears face up is red is $\frac{4}{9}$.

Section 9.1

Q 17.

b. $E_2 = \{YYY, YYB, YBY, BYY, BBB, BBY, BYB, YBB\}$

$N(E_2) = 8$

$P(E_2) = \frac{N(E_2)}{N(S)} = \frac{8}{27}$

at least one of the colors that appears face-up is red is $P(\bar{E}_2)$

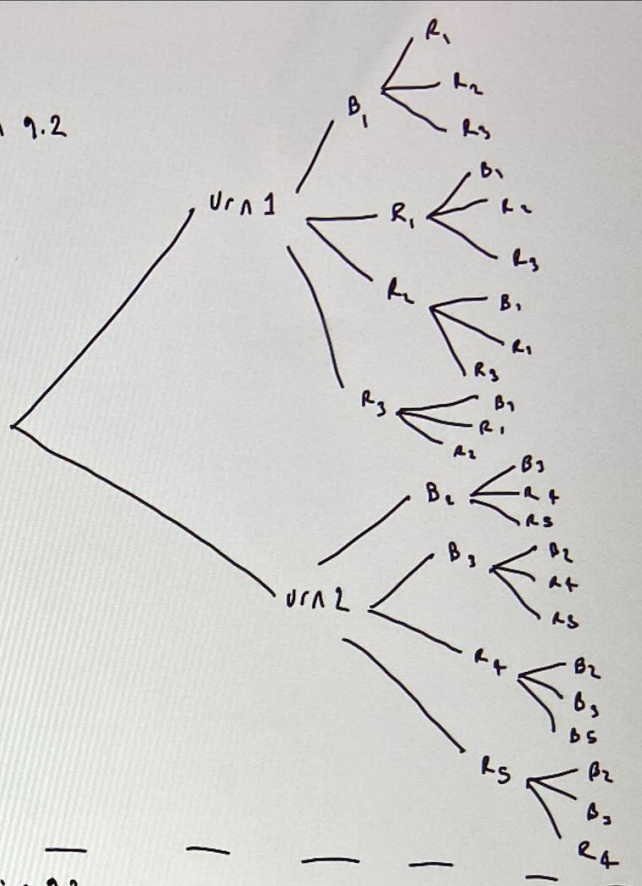
$= 1 - \frac{8}{27} = \frac{19}{27}$

∴ The probability that at least one of the colors that appears face up is red $\frac{19}{27}$.

Section 9.2

Q7.

a.



There are 24 total possible outcomes

Section 9.2

Q7.

B.

Section 9.2

Q7

C.

$P(E) = \frac{\text{The number of successful outcomes in E}}{\text{Total number of outcomes in S}}$

$P(E) = \frac{8}{24} = \frac{1}{3}$

Homework #9

Section 9.2
#32
a.

There are 9 distinct letters in the word algorithm.

$$P(9,9) = \frac{9!}{(9-9)!}$$

$$= \frac{9!}{0!}$$

$$= \frac{9\times8\times7\times6\times5\times4\times3\times2\times1}{1}$$

$$= 362,880$$

Section 9.2
32
b.

AL $8\times7! = 8!$

_AL

__AL $= 40,320$

__AL

___AL

____AL

_____AL

______AL

_______AL

Section 9.2
32
c.

GOR can remain together in 6! ways

GOR $7\times6! = 7!$

_GOR $= 5040$

__GOR

___GOR

____GOR

_____GOR

______GOR

Section 9.3
24
a.

A = the set of all integers from 1 through 1000 that are multiple of 2

B = the set of all integers from 1 through 1000 that are multiple of 9

A ∪ B = all integers from 1 to 1000 that are multiple of 2 or 9

A ∩ B = all integers from 1 to 1000 that are multiple of both 2 and 9

Section 9.3
Q24.
b.

∴ The probability that the integer is a multiple of 2 or a multiple of 9 is $\frac{556}{1000} = .556$

Section 9.3
Q24.
c.

$$N((A\cup B)^c) = N(U - A\cup B)$$

$$= N(U) - N(A\cup B)$$

$$= 1000 - 556$$

$$= 444$$

Section 9.3
Q34
a.

$N(A) = 21$

$N(B) = 21$

$N(C) = 31$

$N(A\cap B) = 9$

$N(A\cap C) = 14$

$N(B\cap C) = 15$

$N(A\cup B\cup C) = 41$

$50 - 41 = 9$

Section 9.3
Q34
b.

$N(A\cup B\cup C) = N(A) + N(B) + N(C) - N(A\cap B) - N(B\cap C) - N(A\cap C) + N(A\cap B\cap C)$

$41 = 21 + 21 + 31 - 9 - 15 - 14 + N(A\cap B\cap C)$

$41 = 35 + N(A\cap B\cap C)$

$N(A\cap B\cap C) = 6$

∴ Number of people who got relief from all three drugs is 6

$N(A) = 500$

$N(B) = 111$

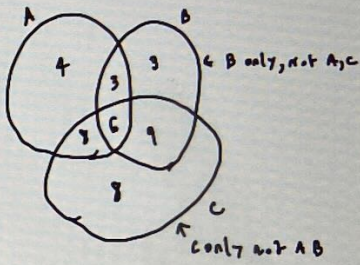
$N(A\cap B) = 55$

$N(A\cup B) = N(A) + N(B) - N(A\cap B)$

$= 500 + 111 - 55$

$= 611 - 55 = 556$

Section 9.3
Q34
c.



Section 9.3
Q34.
d.

$N(A) - N(A\cap B) - N(A\cap C) + N(A\cap B\cap C)$

$21 - 9 - 14 + 6$

$= 4$

∴ Number of subjects who got relief from only A is 4.