Problem set 17,18

Graded

Student

Total Points

91 / 100 pts

Question 1

Exercise 9.1.4

3 / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 2 pts** not written as a set
- **– 1 pt** 1 or more elements missing
- **– 1 pt** incorrect probability

Question 2

Exercise 9.1.6

3 / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 2 pts** not written as a set
- **– 1 pt** 1 or more elements missing
- **– 1 pt** incorrect probability

Question 3

Exercise 9.1.10

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer / incorrect

– 3 pts illegible

– 3 pts wrong problem

– 2 pts not written as a set

– 1 pt 1 or more elements missing

– 1 pt incorrect probability

Question 4

Exercise 9.1.11b(ii)

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer / incorrect

– 3 pts illegible

– 3 pts wrong problem

– 2 pts not written as a set

– 1 pt 1 or more elements missing

– 1 pt incorrect probability

Question 5

Exercise 9.1.11b(iii)

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer / incorrect

– 3 pts illegible

– 3 pts wrong problem

– 2 pts not written as a set

– 1 pt 1 or more elements missing

– 1 pt incorrect probability

Question 6

Exercise 9.1.14b

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 1.5 pts incorrect probability numerator

– 1.5 pts incorrect probability denominator

Question 7

Exercise 9.1.14c

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 1.5 pts incorrect probability numerator

– 1.5 pts incorrect probability denominator

Question 8

Exercise 9.1.19b set

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 1 pt 1 outcome missing

– 1.5 pts 2 or more outcomes missing

– 0.5 pts incorrect notation

Question 9

Exercise 9.1.19b probability

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 1.5 pts incorrect numerator

– 1.5 pts incorrect denominator

– 1 pt arithmetic error

Question 10

Exercise 9.1.22a

5 / 5 pts

✔ **– 0 pts** Correct

– 5 pts incorrect/no answer

– 5 pts illegible

– 5 pts wrong problem

– 2.5 pts incorrect numerator

– 2.5 pts incorrect denominator

Question 11

Exercise 9.1.22b

5 / 5 pts

✔ **– 0 pts** Correct

– 2.5 pts incorrect numerator

– 2.5 pts incorrect denominator

– 5 pts no answer

– 5 pts illegible

– 5 pts wrong problem

Question 12

Exercise 9.2.7a

4 / 4 pts

- ✔ **– 0 pts** Correct
- **– 4 pts** no answer
- **– 4 pts** illegible
- **– 4 pts** wrong problem
- **– 4 pts** not a possibility tree
- **– 2 pts** incomplete tree (half)
- **– 3 pts** substantially incomplete tree
- **– 1.5 pts** missing 1-2 things

Question 13

Exercise 9.2.7b

3 / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect

Question 14

Exercise 9.2.7c

1.5 / 3 pts

- **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- ✔ **– 1.5 pts** incorrect numerator
- **– 1.5 pts** incorrect denominator

Question 15

Exercise 9.2.12n **1.5** / 3 pts

- **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect
- ✔ **– 1.5 pts** single error

Question 16

Exercise 9.2.15 **3** / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect
- **– 1.5 pts** part a incorrect
- **– 1.5 pts** part b incorrect

Question 17

Exercise 9.2.18b **3** / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect
- **– 1.5 pts** arithmetic error

Question 18

Exercise 9.2.22b

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 19

Exercise 9.2.22c

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 20

Exercise 9.2.26

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 21

Exercise 9.2.33a

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 22

Exercise 9.2.33b

0 / 3 pts

- **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem

✔ **– 3 pts** incorrect

Question 23

Exercise 9.2.33c

3 / 3 pts

✔ **– 0 pts** Correct

- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect

Question 24

Exercise 9.5.2a

4 / 4 pts

✔ **– 0 pts** Correct

- **– 4 pts** no answer
- **– 4 pts** illegible
- **– 4 pts** wrong problem
- **– 2 pts** missing 2 or more elements
- **– 1 pt** missing 1 element
- **– 1 pt** incorrect count

Review notation. the subsets should have curly brackets around them

Question 25

Exercise 9.5.4 **0** / 3 pts

- **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- ✔ **– 3 pts** wrong problem
- **– 3 pts** incorrect

Question 26

Exercise 9.5.5d **3** / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem
- **– 3 pts** incorrect

Question 27

Exercise 9.5.7a **3** / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** incorrect
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem

Question 28

Exercise 9.5.7b(i) **3** / 3 pts

- ✔ **– 0 pts** Correct
- **– 3 pts** incorrect
- **– 3 pts** no answer
- **– 3 pts** illegible
- **– 3 pts** wrong problem

Question 29

Exercise 9.5.9a

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 30

Exercise 9.5.10

3 / 3 pts

✔ **– 0 pts** Correct

– 3 pts no answer

– 3 pts illegible

– 3 pts wrong problem

– 3 pts incorrect

Question 31

Exercise 9.5.14a

4 / 4 pts

✔ **– 0 pts** Correct

– 4 pts incorrect

– 4 pts no answer

– 4 pts illegible

– 4 pts wrong problem

– 2 pts Incorrect Evaluation

Put your answer in each indicated box. Answers must be handwritten, legible and use correct notation.
Study the answers in Appendix A to similar problems so you know what your approach should be.
Larger boxes indicate that you are expected to provide substantial detail.
UNLESS OTHERWISE INSTRUCTED: do not use P(n,r) or C(n,r) notation as a final answer, do not reduce fractions, and do not expand factorials.

Students learning counting techniques often ask, "How do I know what to multiply and what to add? When do I use the multiplication rule and when do I use the addition rule?" Unfortunately, these questions have no easy answers. You need to imagine, as vividly as possible, the objects you are to count. You might even start to make an actual list of the items you are trying to count to get a sense for how to obtain them in a systematic way. You should then construct a model that would allow you to continue counting the objects one by one if you had enough time. If you can imagine the elements to be counted as being obtained through a multistep process (in which each step is performed in a fixed number of ways regardless of how preceding steps were performed), then you can use the multiplication rule. The total number of elements will be the product of the number of ways to perform each step. If, however, you can imagine the set of elements to be counted as being broken up into disjoint subsets, then you can use the addition rule. The total number of elements in the set will be the sum of the number of elements in each subset.

One of the most common mistakes students make is to count certain possibilities more than once.

— Discrete Structures, Susanna Epps, fourth edition, p.577

♠ - spades ♣ - clubs

1. Exercise 9.1.4 set

{2♠, 4♠, 6♠, 8♠, 10♠, 2♣, 4♣, 6♣, 8♣, 10♣}

probability

10/52

2. Exercise 9.1.6 set

{2♡, 3♡, 4♡, 2♢, 3♢, 4♢, 2♣, 3♣, 4♣, 2♠, 3♠, 4♠}

probability

12/52

3. Exercise 9.1.10 set

{⚅⚅, ⚅⚄, ⚅⚃, ⚅⚂, ⚅⚁, ⚄⚄, ⚄⚃, ⚄⚂, ⚄⚁, ⚃⚃, ⚃⚂, ⚃⚁, ⚂⚂, ⚂⚁, ⚁⚁}

probability

10/36

4. Exercise 9.1.11b(ii) set

{HHT, HTH, THH, HHH}

probability

4/8

5. Exercise 9.1.11b(iii)) set

{TTT}

probability

1/8

6. Exercise 9.1.14b

P(all ill) = 1/8

P(two ill) = 3/8

P(two ill) + P(all ill) = 4/8

7. Exercise 9.1.14c

1/8

8. Exercise 9.1.19b set

$\{B_1W_1, B_1W_2, B_1W_3, B_2W_1, B_2W_2, B_2W_3, B_1B_1, B_1B_2, B_2B_1, B_2B_2\}$

9. Exercise 9.1.19b probability

10/25

10. Exercise 9.1.22a

lowest three digit multiple of 6 : 102

highest " " " : 996

102 = 6(17)

996 = 6(166)

[17, 166]

166 - 17 + 1

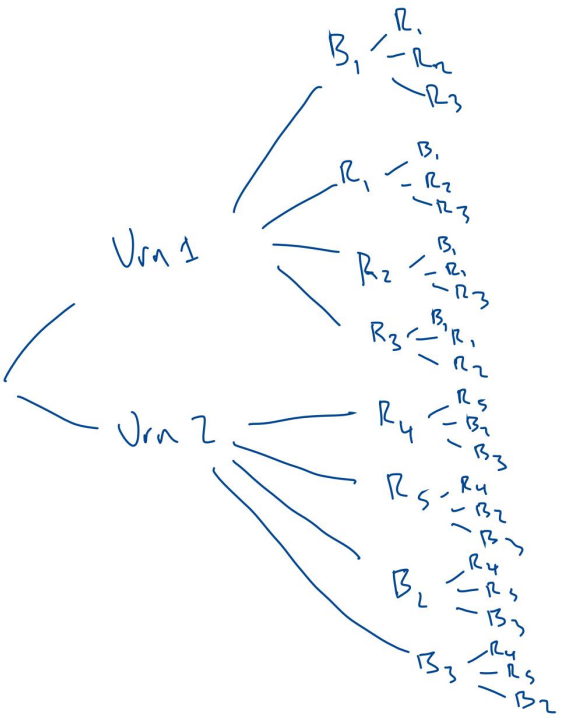
11. Exercise 9.1.22b

(166 - 17 + 1) / (999 - 100 + 1)

[100, 999]

999 - 100 + 1

12. Exercise 9.2.7a



13. Exercise 9.2.7b

24 outcomes

14. Exercise 9.2.7c

$\frac{5}{24}$

15. Exercise 9.2.12b

10 Hexadecimal digits between 4 through D

14 Hexa decimal digits between 2 through E

$10 \cdot 16 \cdot 16 \cdot 16 \cdot 16 \cdot 14$

16. Exercise 9.2.15

a) $30 \cdot 30 \cdot 30 = 30^3$ possible combinations

b) $30 \cdot 29 \cdot 28$ possible combinations

17. Exercise 9.2.18b

$5 \rightarrow \{5, J, K, L\}$

$0 \rightarrow \{0\}$

$3 \rightarrow \{3, D, E, F\}$

$1 \rightarrow \{1, Q, Z\}$

$4 \cdot 1 \cdot 4 \cdot 3$

18. Exercise 9.2.22b

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$

19. Exercise 9.2.22c

n^m

20. Exercise 9.2.26

$m \cdot n \cdot p$

21. Exercise 9.2.33a

$6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

$6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

22. Exercise 9.2.33b

$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

$1 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

↓ Doctor

23. Exercise 9.2.33c

$3 \cdot 2 \cdot 1$

24. Exercise 9.5.2a list

$\{ x_1x_2x_3, x_1x_3x_4, x_1x_4x_5, x_1x_2x_4, x_1x_2x_5, x_1x_3x_5, x_2x_3x_4, x_2x_3x_5, x_2x_4x_5, x_3x_4x_5 \}$

value

10

25. Exercise 9.5.4

$P(7,2) = 2!\left(\frac{7}{2}\right)$

26. Exercise 9.5.5d

$\frac{6!}{3!(6-3)!} = \frac{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{3 \cdot 2 \cdot 1 \quad 3 \cdot 2 \cdot 1} = \frac{6 \cdot 5 \cdot 4}{3 \cdot 2 \cdot 1} = 20$

27. Exercise 9.5.7a

$\binom{13}{7} = \frac{13!}{7!(13-7)!} = \frac{13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7!}{(7!)(6!)} = \frac{13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8}{6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}$

28. Exercise 9.5.7b(i)

7 women, 6 men

$C(7,4) \cdot C(6,3)$

29. Exercise 9.5.9a

$$C(40, 6) = \frac{40!}{6!(40-6)!}$$

30. Exercise 9.5.10

$$C(60, 22) \cdot C(38, 22) \cdot C(16, 16)$$

Drug A Drug B Control

31. Exercise 9.5.14a

$$C(16, 7) = \frac{16!}{7!(16-7)!}$$