Practice Book *UNIT 21 Probability of One Event* Answers

21.1 Introduction to Probability

1. (a) Certain

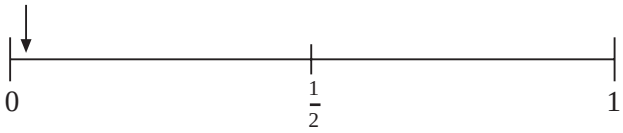
   (b) Depends on the day of the week and whether the student normally travels to school by bus.

   (c) Depends on the football team and who they are playing.

   (d) Depends on the weather, the time of year and the general punctuality of the student.

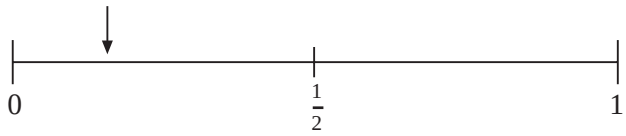
2. (a) E (b) A (c) B (d) D

3. (a)



   (b) Depends on the student; it could be 0 for a student who does not have a packed lunch, or close to 0 for a student who brings a packed lunch regularly, but it could be much higher for a student who brings a packed lunch only occasionally.

   (c)



   (d) Depends on the location of the school and the time of year.

   (e) 1 – (answer to (d)).

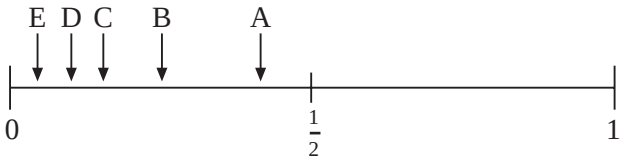
5. (a) A (b) D (c) A and C (d) B, C and D

6. (a) Depends on the time of year this unit is taught.

   (b) 1 – (answer to (a)) (or very close to it, for example, if a student is repeating a year).

7. Depends on the student and the level of difficulty of the homework.

8. Depends on the student but should show a decreasing likelihood from A through to E, for example:



21.2 Calculating the Probability of a Single Event

1. (a) $\frac{1}{2}$ (b) $\frac{1}{6}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$ (e) $\frac{1}{3}$ (f) $\frac{1}{2}$

2. (a) $\frac{3}{10}$ (b) $\frac{7}{10}$

3. $\frac{1}{2}$

21.2 Answers

4. (a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$

5. (a) $\frac{1}{8}$ (b) $\frac{1}{8}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$ (e) $\frac{5}{8}$

6. (a) $\frac{1}{2}$ (b) $\frac{3}{8}$ (c) $\frac{1}{8}$ (d) $\frac{1}{2}$ (e) $\frac{5}{8}$

7. (a) $\frac{2}{5}$ (b) $\frac{3}{5}$

8. (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{6}$ (d) $\frac{1}{2}$ (e) $\frac{5}{6}$

9. (a) $\frac{3}{16}$ (b) $\frac{3}{32}$ (c) $\frac{7}{32}$
   (d) $\frac{1}{16}$ (e) $\frac{25}{32}$ (f) $\frac{7}{8}$

10. 4

21.3 Relative Frequency

3. (d) Should get closer to $\frac{1}{6}$ if the dice is fair.

5. $\frac{2}{5}$

7. (a) $\frac{7}{50}$ (b) $\frac{3}{50}$ (c) $\frac{14}{25}$ (d) $\frac{2}{5}$

8. 10

9. (a) $\frac{3}{10}$
   (b) The estimate was based on only a small number of games. It also reflects the teams already played and, in the next match, they may play a stronger or weaker team than those they have played so far.

10. Approximately 0.65 or $\frac{2}{3}$.

21.4 Complementary Events

1. $\frac{2}{5}$

2. $\frac{7}{8}$

3. $\frac{19}{20}$

21.4 Answers

4. 0.9

5. 0.25

6. $\frac{12}{13}$

7. (a) $\frac{1}{3}$ (b) $\frac{2}{3}$

8. (a) $\frac{1}{2}$ (b) $\frac{1}{2}$

9. (a) $\frac{2}{5}$ (b) $\frac{3}{5}$

10. (a) $\frac{33}{100}$ (b) $\frac{67}{100}$

21.5 Estimating the Number of Outcomes

1. (a) 100 (b) 300 (c) 300 (d) 200

2. (a) 40 (b) 80 (c) 80 (d) 120

3. 6

4. 5

5. (a) 2 (b) 8 (c) 40

6. (a) 18 (b) 60

7. (a) 1000 (b) 6 (c) 1

8. (a) 14 (b) 49 (c) 700

9. 13

10. (a) 2, assuming he goes to school 5 days a week.

    (b) Because the expected number of times missed is a long term average; sometimes he might miss the bus 3 times, as here, and other times he might miss it once, twice or not at all.

21.6 Addition Law for Mutually Exclusive Events

1. (a) $\frac{3}{10}$ (b) $\frac{1}{4}$ (c) $\frac{9}{20}$ (d) $\frac{11}{20}$ (e) $\frac{3}{4}$ (f) $\frac{7}{10}$

2. (a) $\frac{1}{5}$ (b) $\frac{2}{5}$ (c) $\frac{2}{5}$ (d) $\frac{4}{5}$ (e) $\frac{3}{5}$ (f) $\frac{3}{5}$

3. (a) $\frac{1}{10}$ (b) $\frac{9}{20}$ (c) $\frac{11}{20}$ (d) $\frac{3}{4}$

21.6 Answers

4. (a) $\frac{1}{3}$ (b) $\frac{5}{6}$ (c) $\frac{5}{6}$

5. (a) $\frac{5}{8}$ (b) $\frac{3}{16}$ (c) $\frac{5}{16}$ (d) $\frac{9}{16}$

6. (a) $\frac{3}{8}$ (b) $\frac{1}{4}$ (c) $\frac{3}{8}$ (d) $\frac{3}{8}$

7. (a) $\frac{1}{2}$ (b) $\frac{1}{4}$ (c) $\frac{1}{2}$

8. (a) $\frac{5}{12}$ (b) $\frac{3}{4}$

9. (a) $\frac{3}{10}$ (b) $\frac{7}{15}$ (c) $\frac{8}{15}$ (d) $\frac{7}{10}$

10. (a) $\frac{1}{4}$ (b) $\frac{3}{4}$

21.7 General Addition Law

1. (a) $\frac{6}{11}$ (b) $\frac{3}{11}$ (c) $\frac{2}{11}$ (d) $\frac{7}{11}$

2. (a) $\frac{1}{2}$ (b) $\frac{2}{5}$ (c) $\frac{1}{5}$ (d) $\frac{7}{10}$

3. $\frac{2}{3}$

4. $\frac{1}{2}$

5. $\frac{23}{100}$

6. $\frac{19}{24}$

7. $\frac{1}{2}$

8. $\frac{7}{30}$

9. 0.35

10. 1 occurs twice; 2 occurs twice; 3 occurs once; 4 occurs once.