

QUESTIONS

page 25 **Example 10**

The first line of the solution should be:

The length of 20 cm could be...

page 39 **Slope or gradient**

The first paragraph after the “Hill profile” graph should be:

Each step we take, we are moving to the right horizontally and upwards vertically. To measure the amount of slope or gradient we compare the vertical rise to the horizontal run.

page 77 **Exercise 1E**

7 h ii If the patrol boat has a maximum speed of 12 knots (1 knot = 1.85 km/hr) use your diagram to estimate how long it could take to reach the ship in distress. Show how you got this estimate.

page 114 **Example 20**

In the table, the data from the ‘Franked amount’ column (\$981.80) should be moved to the ‘Unfranked amount’ column.

page 127 **Comparing share returns and inflation**

The table showing movements in the All Ords and the ASX200 from Jan 2000 should read as follows:

Month	All Ord Index	ASX200 Index
Jan-00	3096.0	3080.2
Feb-00	3135.7	3124.6
Mar-00	3133.3	3133.3
Apr-00	3085.1	3115.8
May-00	3040.6	3081.0
Jun-00	3257.6	3311.2
Jul-00	3213.6	3251.1
Aug-00	3261.7	3297.8
Sep-00	3246.1	3298.8
Oct-00	3203.9	3254.6
Nov-00	3222.0	3274.6
Dec-00	3154.7	3206.2
Jan-01	3291.5	3341.7
Feb-01	3274.1	3326.5
Mar-01	3096.9	3147.2
Apr-01	3270.3	3329.4
May-01	3317.2	3379.1
Jun-01	3425.2	3490.3
Jul-01	3270.8	3324.5
Aug-01	3217.8	3275.6
Sep-01	2988.0	3049.5
Oct-01	3185.3	3249.6
Nov-01	3277.0	3337.4
Dec-01	3359.9	3422.3
Jan-02	3404.0	3464.2
Feb-02	3358.6	3414.3
Mar-02	3363.3	3414.8
Apr-02	3299.5	3350.0
May-02	3325.1	3373.6
Jun-02	3163.2	3216.0
Jul-02	3032.6	3086.2
Aug-02	3073.7	3120.1
Sep-02	2928.3	2970.9
Oct-02	2995.0	3042.9

page 145 **Example 4**

The last line of the first paragraph of the solution should be: “The queue length does not include the person being served.”

The queue length in the last column of the table should be one less in each case.

page 145 **Exercise 3B.1**

1 The value in the ‘Queue Length’ column should be 0.

page 147 **Example 5**

The queue length in the last column of the table should be 0, not 1 in each case.

The working for the solution should be:

$$\begin{aligned} &\text{Average waiting time} \\ &= \frac{\text{total waiting time}}{\text{number of customers}} \\ &= \frac{0}{7} \\ &= 0 \end{aligned}$$

The server idle time of 13 minutes does not include the time when server 2 is waiting until 9:21 for the 8th customer.

$$\begin{aligned} &\text{Percentage idle time} \\ &= \frac{\text{total idle time}}{\text{time studied}} \times \frac{100}{\text{number of servers}} \\ &= \frac{13}{22} \times \frac{100}{2} \\ &= 29.55\% \text{ per server} \end{aligned}$$

page 148 **Exercise 3B.2**

1 The value in the ‘Queue Length’ column should be 0.

page 149 **Example 6**

The values in the “Queue Length” column should be 0 for customers 1 to 5 and 1 for customers 6 and 7.

The last line of the solution should be:

Percentage idle time: for the first 15 minutes while there are two servers = $\frac{9}{15} \times \frac{100}{2} = 30\%$ per server. The percentage idle time after 9:15 = 0%

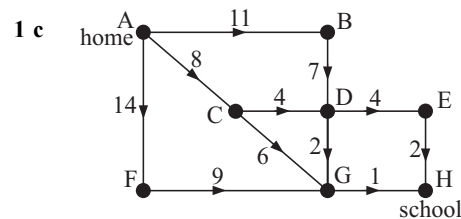
page 150 **Exercise 3B.2**

1 Assume that each salesman works no more than 8 hours for this question.

page 252 **Spreadsheet Investigation**

The formula in Cell B7 within the template spreadsheet file should be ‘=B5/B6’

page 396 **Exercise 7A.2**



page 468 **Example 17**

The last line of the first paragraph of the solution should be: “The queue length does not include the person being served.”

The queue length in the last column of the table should be one less in each case.

page 469 **Example 18**

The last line of the first paragraph of the solution should be: “The queue length does not include the person being served.”

The queue length in the last column of the table should be one less in each case.

page 470 **Exercise 8C.1**

- 1** The 'Queue length' column in the table should contain the value 0.
- 2 c** Question should read: 'Calculate the percentage idle time for the sales person if the shop opens at 9 am.'
- 3** Question should read: 'A fast food outlet has one server who takes two minutes to serve each customer. The arrival time after 9 am of the first ten customers is shown in the table below.'

page 472 **Example 19**

The queue length in the last column of the table should be 0, not 1 in each case.

The working for the solution should be:

$$\begin{aligned} \text{Average waiting time} &= \frac{\text{total waiting time}}{\text{number of customers}} \\ &= \frac{0}{7} \\ &= 0 \end{aligned}$$

The server idle time of 13 minutes does not include the time when server 2 is waiting until 9:21 for the 8th customer.

$$\begin{aligned} \text{Percentage idle time} &= \frac{\text{total idle time}}{\text{time studied}} \times \frac{100}{\text{number of servers}} \\ &= \frac{13}{22} \times \frac{100}{2} \\ &= 29.55\% \text{ per server} \end{aligned}$$

page 473 **Exercise 8C.2**

- 1** The value in the 'Queue Length' column should be 0.

page 480 **Investigation 4**

- 2 b** should read "the uniform distribution"

page 482 **Exercise 8C.3**

- 4 b** the uniform distribution using appropriate devices
- c** the uniform distribution using technology

ANSWERS

page 494 **Exercise 1A.2**

- 6 a** 20 m × 39 m

page 495 **Exercise 1B**

- 7 a** 391.4 mm
- 13 e i** 0.765 m³

page 496 **Exercise 1B**

- 18 a** 1.240 m

page 496 **Exercise 1C.1**

- 5** 80.4 m to 80.8 m

page 496 **Exercise 1C.5**

- 1 b** 3.55 km

page 497 **Exercise 1C.7**

- 5 a** 14.74°

page 500 **Exercise 2D.6**

- 1 e** \$120
- 3 d** \$332 (ignoring brokerage and GST)

page 500 **Exercise 2D.7**

- 4** \$5424

page 501 **Exercise 2G.1**

- 1 b** 6.72% increase

page 501 **Exercise 2G.3**

- 2 c** Index month 1 = 500, Index month 2 = 516.0, % increase = 3.2%

page 502 **Exercise 2G.6**

- 3** ASX200 10.86% increase, CPI 10.07% increase.
Heather's share fund received a real growth.

page 502 **2H Review**

- 14 d** \$1600
- 21 c** \$0.09
- d** \$450 (ignoring brokerage and GST)

page 503 **Exercise 3A.1**

- 1 e** First two lines of answer should be:
Building A - \$28.80 per square metre per annum
Building B - \$22.86 per square metre per annum

page 503 **Exercise 3B.1**

3 a

Cus.	Arr. time	Start serv.	Fin. serv.	Cust. W. T.	Serv. I. T.	Que. len.
1	9:02	9:02	9:06	0	0	0
2	9:04	9:06	9:10	2	0	1
3	9:06	9:10	9:14	4	0	1
4	9:08	9:14	9:18	6	0	2
5	9:10	9:18	9:22	8	0	2
6	9:12	9:22	9:26	10	0	3
7	9:14	9:26	9:30	12	0	3
8	9:16	9:30	9:34	14	0	4
9	9:18	9:34	9:38	16	0	4
Total				72	0	

- c** 0%

page 504 **Exercise 3B.2**

1

Cus.	Arr. time	Tell.	Start Serv.	Fin. Serv.	Cust. W. T.	Tell. I. T.	Que. len.
1	10:02	1	10:02	10:05	0	2	0
2	10:04	2	10:04	10:07	0	4	0
3	10:06	1	10:06	10:09	0	1	0
4	10:08	2	10:08	10:11	0	1	0
5	10:10	1	10:10	10:13	0	1	0
6	10:12	2	10:12	10:15	0	1	0
7	10:14	1	10:14	10:17	0	1	0
8	10:16	2	10:16	10:19	0	1	0
9	10:18	1	10:18	10:21	0	1	0
10	10:20	2	10:20	10:23	0	1	0
Total					0	14	

- 1 b** 32.9%
- 2** It takes 12 minutes before a customer...

3 a

Cus.	Arr. time	Serv.	Start Serv.	Fin. Serv.	Cust. W. T.	Serv. I. T.	Que. len.
1	8:30	1	8:30	8:35	0	0	0
2	8:33	2	8:33	8:38	0	3	0
3	8:36	1	8:36	8:41	0	1	0
4	8:39	2	8:39	8:44	0	1	0
5	8:42	1	8:42	8:47	0	1	0
6	8:45	2	8:45	8:50	0	1	0
7	8:48	1	8:48	8:53	0	1	0
8	8:51	2	8:51	8:56	0	1	0
9	8:54	1	8:54	8:59	0	1	0
10	8:57	2	8:57	9:02	0	1	0
Total					0	11	

c 18.75%

Cus.	Arr. time	Serv.	Start Serv.	Fin. Serv.	Cust. W. T.	Serv. I. T.	Que. len.
1	8:30	1	8:30	8:35	0	0	0
2	8:33	2	8:33	8:38	0	3	0
3	8:36	1	8:36	8:41	0	1	0
4	8:39	2	8:39	8:44	0	1	0
5	8:42	1	8:42	8:47	0	1	0
6	8:45	2	8:45	8:50	0	1	0
7	8:48	1	8:48	8:53	0	1	0
8	8:51	1	8:53	8:58	2	0	1
9	8:54	1	8:58	9:03	4	0	1
10	8:57	1	9:03	9:08	6	0	2
Total					12	8	

page 505 Exercise 3B.2

4 c 20% up to 8:50 am, 0% after 8:50 am

5 2 hours 20 minutes

6 c 20%

page 505 Exercise 3C.1

2 \$720.50

3 \$649.00

4 \$822.25

page 505 Exercise 3C.3

2 -0.20% (loss)

page 505 Exercise 3C.4

1 b \$1417.96

page 505 Exercise 3C.4

1 a under the heading 'Expenses', Advertising should be \$28 500
Total expenses = (\$138 150)
Profit = \$309 190

page 507 Exercise 3C.9

1 b

Age (years)	Annual deprec.	Cumul. deprec.	Book value
0	0	0	86 000
1	17 200	17 200	68 800
2	13 760	30 960	55 040
3	11 008	41 968	44 032
4	8806	50 774	35 226
5	7045	57 819	28 181

c

Age (years)	Annual deprec.	Cumul. deprec.	Book value
0	0	0	157 800
1	35 505	35 505	122 295
2	27 516	63 021	94 779
3	21 325	84 346	73 454
4	16 528	100 874	56 927
5	12 809	113 683	44 118
6	9927	123 610	34 191

page 508 Exercise 3C.10

- 1 a Total Remuneration = \$17 737.32
Levy = \$17 737 × 2.95% = \$523.24
GST = \$53.32
OHS&W = \$5.23
∴ Total Levy = \$580.79
- b Levy = \$17 649 × 1.3% = \$229.43
∴ Total Levy = \$254.66
- c OHS&W = \$1.52
∴ Total Levy = \$169.51
- d Levy = \$9226 × 4.55% = \$419.78
GST = \$41.97
OHS&W = \$4.19
∴ Total Levy = \$465.94

page 508 Exercise 3C.12

- 1 \$78 139.27
2 \$18 486

page 509 Exercise 3C.14

- 1 a Plus-Purchases = \$365 715
Goods available for sale = \$600 465
Less - closing stock = \$313 965
Gross profit = \$263 835
∴ Net profit = \$157 927

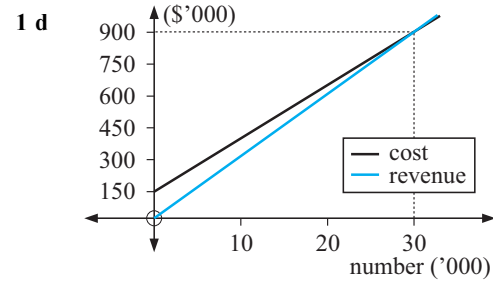
page 510 Exercise 3C.15

- 1 e \$2 357 631 profit

page 510 Exercise 3C.16

- 3 4632

page 510 Exercise 3C.17



page 510 Exercise 3D.1

- 1 b \$6351.95
f \$4122.70

page 510 Exercise 3D.2

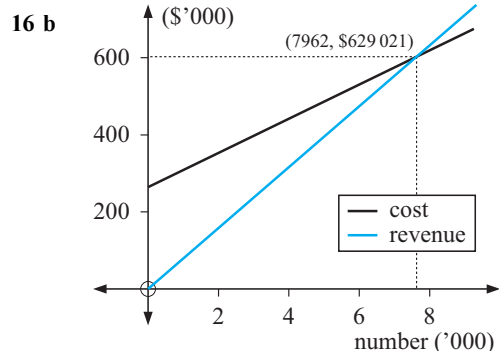
- 1 b \$1619.90 saving
d \$3679.91 tax saving
e \$2952.73 tax saving

page 511 Exercise 3D.3

- 4 c \$61 240

page 511 3E Review

- 3 \$190.58
7 a Offer 2 (\$672.36 v's \$679.73)
8 Under expenses, Office stationery should be \$2554.
∴ Total expenses = \$113 058 and profit = \$31 439



17 c \$2545.81

4 a $2H = \dots$

1 c Value in the top right corner of the matrix should be 198

5 c income = \$35 842.50

4 d iv last line of solution should read: $B \rightarrow C \rightarrow B \rightarrow D \rightarrow E$

2 d matrix on last line should be:

$$C^3 = \begin{bmatrix} 3 & 3 & 3 & 1 & 2 \\ 2 & 3 & 4 & 1 & 3 \\ 3 & 2 & 4 & 2 & 4 \\ 1 & 1 & 2 & 1 & 2 \\ 4 & 3 & 4 & 2 & 4 \end{bmatrix}$$

4 d answer should be 11
The missing paths are:
 $B \rightarrow A \rightarrow B \rightarrow A$ and
 $B \rightarrow A \rightarrow B \rightarrow D$

6 b two paths are missing:
 $A \rightarrow \rightarrow A$ and
 $A \rightarrow \rightarrow C$

1 b

$$C^2 = \begin{bmatrix} 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$

2 c You can not travel from K to K, K to O, or M to M in ≤ 2 stages.

10 b second line should be:

$$C + C^2 + C^3 = \begin{bmatrix} 1 & 3 & 1 & 2 & 4 \\ 2 & 1 & 2 & 2 & 2 \\ 1 & 3 & 2 & 3 & 6 \\ 0 & 1 & 1 & 1 & 2 \\ 1 & 1 & 2 & 2 & 2 \end{bmatrix}$$

12 The positions of New Zealand & Australia should be swapped

14 b The 3rd row of $T^2 \dots$

1 22 quarters ($5\frac{1}{2}$ years)

1 a \$83 026

2 a \$1451.25

c 8.27%

4 d The fortnightly option charges the least interest of \$1397.40...

3 d \$217 092.20

1 c \$69 035.17

2 c \$82 496.58

5 a \$611.17

b \$611.46

6 a \$1440.06

b \$1439.06

7 \$52.51, \$50.59

10 \$1316.27

11 \$41.98

40 d The fortnightly option changes...

50 a \$2705.15

b \$2703.63

2 1 departmental manager, 3 supervisors, 9 senior staff, 13 junior sales staff and 4 shelf packers.

5 e $\div 100.7$ minutes

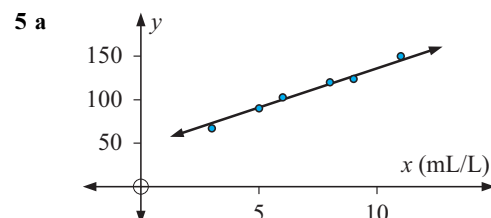
4 c Yard A: IRQ = 2, Yard B: IRQ = 3

3 Females have the higher relative dispersion of wages (5.143)

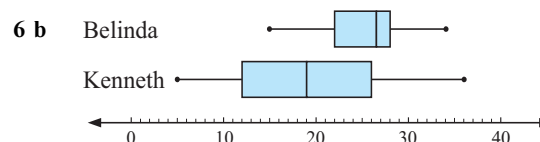
5 c The value in column L for *Geog* should be 1.0521

8 b 16 400

3 d There is a moderate correlation between the variables ($r^2 = 0.5520$), and the data appears to be fairly randomly scattered around the line of best fit. \therefore an interpolation should be reasonably accurate.

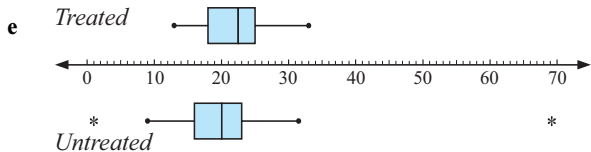


4 c Yes - fair dice would give a median of around 10, not 15



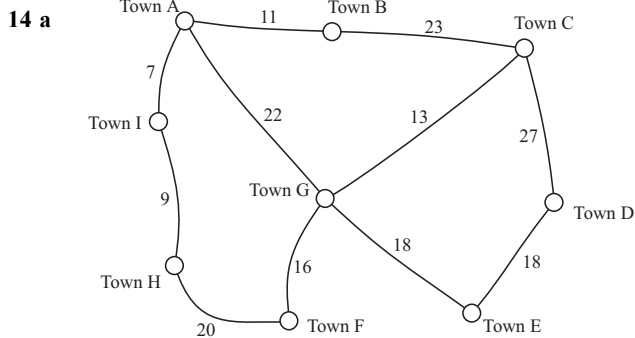
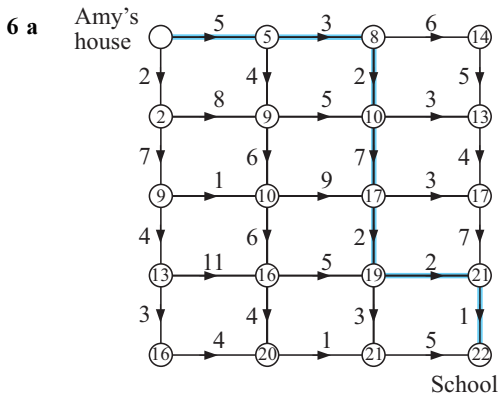
7 c Answer should be:

Yes, there are outliers for the untreated group: 1 month and 69 months. The one month lifespan could be the result of another cause of death or particularly severe cancer and the 69 month lifespan could be the result of misdiagnosis or a partial recovery by the patient, but without evidence of an error, they should not be removed.



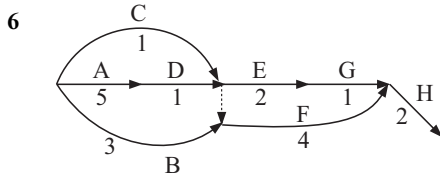
18 b Yes, the point (1.7, 597) is an outlier...

page 537 Exercise 7A.2

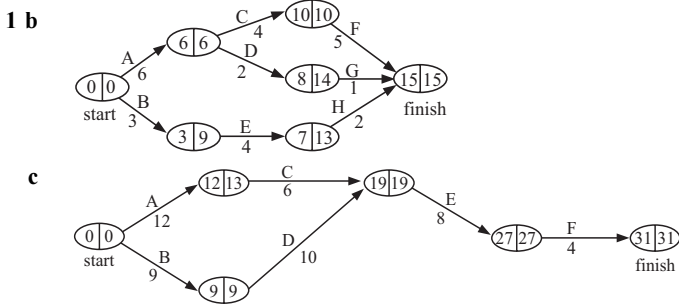


b iii 65

page 538 Exercise 7A.5



page 538 Exercise 7A.6



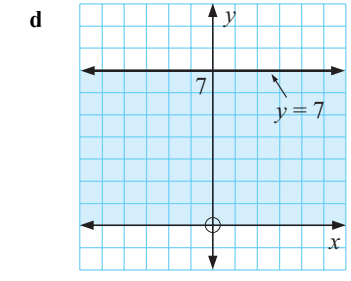
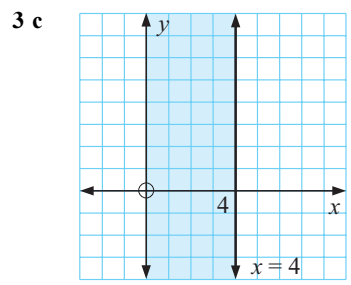
page 539 Exercise 7A.6

6 b 16 hours

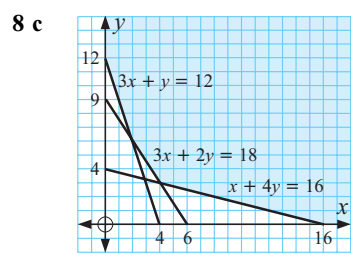
page 539 Exercise 7B.1

4 c $3M + 2C \leq 25$

page 540 Exercise 7B.2



page 542 Exercise 7B.3



page 542 Exercise 7B.4

1 $5x + y \leq 15, x + 4y \leq 12$

page 542 Exercise 7B.5

5 a 5 of A, 3 of B

page 542 Exercise 7B.6

1 d 6 serves of A, 3 serves of B, 8 serves of A, 2 serves of B

page 543 7C Review

- 5 6 gas meters and 3 water meters
- 9 2 soft and 6 hard inner soles
- 11 a Maximise the objective function of $14x + 17y$ subject to $20x + 10y \leq 220$ $40x + 30y \leq 480$ $69x + 90y \leq 1080$ $10x + 30y \leq 330$

page 543 Exercise 8A.1

- 2 a 98.82%
- 5 b 0.0667

page 543 Exercise 8A.3

- 7 \$150. The average is...
- 9 \$100

page 544 Exercise 8A.6

- 6 a 0.21
- b 0.15
- c 32
- 7 a 0.753

page 544 Exercise 8B.4

- 7 a 0.0694
- b 205

page 544 **Exercise 8C.1**

- 1** The queue length in the last column of the table should be one less in each case.
1 b 6.25%

page 545 **Exercise 8C.1**

- 1 f** 6 minutes
3 a The queue length in the last column of the table should be one less in each case.
4 2 hours (i.e., till 4 pm)
5 e 1.69 minutes
i numbers 1, 13, 14 and 15

page 545 **Exercise 8C.2**

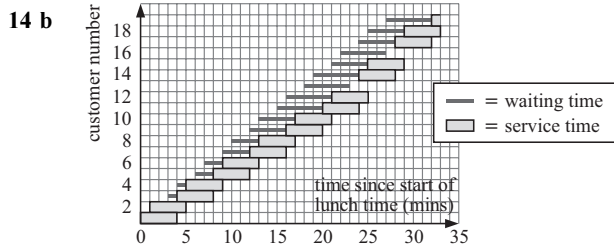
- 1** The queue length in the last column of the table should be 0, not 1 in each case.
1 b 32.6%
2 12 minutes
3 c 41.2%
d No, a 41.2% idle time...
4 b 5.6 minutes

page 546 **Exercise 8D**

- 2 b** The frequency for the run length of 1 should be 19, making a total of 35.
 Average length = 2.2. The expected...
3 e The frequency for the length of 2 should be 3, making a total of 29.
 Average length = 1.1. The expected...

page 547 **8E Review**

- 8 b** \$12 (total return \$32)
13 b Customers will leave the queue



- e** Three servers, as the 16.7% idle time is not as costly as losing 25% of her customers.

page 548 **8E Review**

- 17 b** There are 43 runs of average length 1.3 of...
18 b The *Actual* values should be: 0, 0, 1, 13, 22 and 0.