

**ERRATA FOR MATHEMATICAL STUDIES**  
(as at 17 March 2006)

**ERRATA FOR INITIAL PRINT RUN**

**QUESTIONS**

page 31 **Review Set 1B**

7 Last line on page should be [Hint: Look for similar triangles]

page 65 **Exercise 2G.2**

4 third row of table should read "Jul 01 to Sep 30"

page 85 **Exercise 3B**

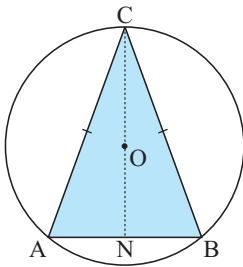
4 Use the first principles formula  $f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$  to find:

page 160 **Exercise 4E**

5 formula should be  $\frac{1}{4}x^2 + 8x + 20$

page 168 **Review Set 4F**

5



page 207 **Exercise 6A**

4 Question should start "A household's rate of consumption..."

page 211

Third line from bottom, equation should be:  $A(t) = \int_a^t f(x)dx$

page 262 **Exercise 7B.5**

2 a Show that each bowler has the same range, and a different mean.

page 264 **Exercise 7B.6**

3 b between \$13.40 and \$28.70

page 290 **Investigation 5**

The Demo file is missing from the CD. The file can be downloaded from <http://www.haeseandharris.com.au/errata/cockles.zip>

page 317

On the first graphics calculator program, the 5<sup>th</sup> line from the top should read: 6,1)→L<sub>1</sub>(A)

page 345

Before the **Example 16** box should be  $z > z_{\frac{\alpha}{2}}$

page 351 **Example 20**

The 7<sup>th</sup> line from the bottom should be: "and  $H_a$  is:  $p > \frac{1}{2}$ ..."

page 372 **Exercise 9C**

9 Questions should start:  
Susan and James opened a new business in 2000...

page 412

Blue box on the last line of the page should read:  
the **multiplication inverse of A**, if it exists, satisfies  $A^{-1}A = AA^{-1} = I$

page 423/425

**Example 13** should be labelled **14** and **Example 14** should be **15**

page 427 **Review Set 10A**

6 if  $A = \begin{bmatrix} 1 & a & 2 \\ a & 1 & 1 \\ 2 & -2 & a+2 \end{bmatrix}$ ,  $\mathbf{x} = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ ,  $\mathbf{b} = \begin{bmatrix} 5 \\ 1 \\ 8 \end{bmatrix}$

**ANSWERS**

page 433 **Review Set 1A**

4 Second line of answer should be:  $0 < x < \frac{50}{9}$

page 433 **Exercise 2A** 1 c \$7196 e \$103 839

page 434 **Exercise 2A**

4 g  $25 \leq x \leq 81$

6 a 's' on the graph should be 'S' c  $S = -3.9 + \frac{19.9}{t+1}$

7 b  $d = 3.72h^{0.498}$  c i 56.6 km ii 178.4 km

d  $d = 82.1$  km,  $R_E = 6740.2$  km (actually 6370 km)

9 b  $H = 2510 - \frac{101150}{t+40.3}$  c i 2316 m ii 2444 m

d Yes - 2510 m by the model

10 c Cost =  $8.92A + 11.547$  A  $5 \times 10$  tarpaulin costs \$457

page 436 **Exercise 2D.2**

2 a	lower = 2.55,	b	$n$	Lower	Upper
	upper = 2.90		100	2.70970	2.72689
			1000	2.71742	2.71914
			10000	2.71820	2.71837
			100000	2.71827	2.71829

page 437 **Exercise 2E**

1 a  $D_L = 18.05$  m,  $D_U = 21.5$  m b  $\div 19.78$  m

2 a  $D_L = 44.8$  m,  $D_U = 69.1$  m

page 437 **Exercise 2G.2** 1 a 96.17 km/h

page 438 **Exercise 2G.4**

1 a 1 m/s b 3 km/h c \$50/item d -5 bats/week

2 a 180 m/min

page 438 **Exercise 2G.5** 6 e 167 insects/day

page 438 **Review Set 2A**

1 c 4 pairs 3 b  $A = 640x - 9.6x^2$  5 b  $S = 0.332x^{-0.659}$

page 439 **Review Set 2C**

1 b solutions are  $x = 1\frac{2}{3}$  and  $x = -5$

page 441 **Exercise 3G** 3 b  $-\frac{1}{9}$

page 443 **Review Set 3E**

10 last line of solution is:  $y = \frac{(2x_1 + y_1)x + 2y_1^2 - 2x_1^2}{x_1 + 2y_1}$

page 443 **Exercise 4A.1** 3 c for all  $T > -10^\circ\text{C}$

page 445 **Exercise 4C.2**

1 h dec  $x \leq -\frac{1}{2}$ ,  $x \geq 3$  inc  $-\frac{1}{2} \leq x \leq 3$

page 446 **Exercise 4C.2**

4 a inc for  $x \geq \sqrt{3}$  and  $x \leq -\sqrt{3}$   
dec for  $-\sqrt{3} \leq x < -1$ ,  $-1 < x \leq 0$ ,  
 $0 \leq x < 1$ ,  $1 < x \leq \sqrt{3}$

page 448 **Exercise 4C.4**

2 g ii  $\dots \left(\sqrt{\frac{2}{3}}, \frac{7}{9}\right) \dots \left(-\sqrt{\frac{2}{3}}, \frac{7}{9}\right)$

page 450 Exercise 4E

2 b min. average cost = \$26.41 (when 79 items are made)

page 450 Review Set 4A 5 b  $k = 9$

page 451 Review Set 4C 4 b ii  $1 \leq t \leq \frac{1 + \sqrt{21}}{2}$

page 452 Review Set 4D 7 c  $80.7 \text{ cm} \times 161.4 \text{ cm}$

page 452 Review Set 4E

3 e  $p < 0, 0 < p < \frac{1}{9}$  or  $p > 1$

page 453 Exercise 5A 3 b  $f'(x) = \frac{-e^{-x}}{(1 - e^{-x})^2}$

page 456 Exercise 5E

7  $63.43^\circ$  10 a  $k = \frac{1}{50} \ln 2 (\div 0.0139)$

page 458 Review Set 5B

4 b As  $x \rightarrow \infty, f(x) \rightarrow \infty,$   
as  $x \rightarrow -\infty, f(x) \rightarrow -x$  (above)

page 459 Review Set 5C 5 a  $x = \ln \frac{2}{3}$  or  $x = 0$

page 459 Exercise 6D 2 e  $3.482 \text{ units}^2$

page 460 Exercise 6E.2

1 e  $\frac{4}{3}x^3 + 2x^2 + x + c$  i  $\frac{1}{4}x^4 + x^3 + \frac{3}{2}x^2 + c$

2 c  $y = x - 2x^2 + \frac{4}{3}x^3 + c$

f  $y = \frac{1}{4}x^4 + 2x^3 + 6x^2 + 8x + c$

page 461 Exercise 6E.4

4 h  $f(x) = 4 \ln |\ln x| + c$  h i  $f(x) = \frac{-1}{\ln x} + c$

page 461 Exercise 6G 2 h i  $\frac{3^{n+1}}{2n+2}, n \neq -1$

page 461 Exercise 6H 2 c  $1\frac{5}{27} \text{ units}^2$  d  $2\frac{1}{4} \text{ units}^2$

page 462 Exercise 6I

11 a Hint is Incorrect e  $0.974 \text{ km} \times 2.05 \text{ km}$

page 462 Review Set 6A 5  $4.5 \text{ units}^2$

page 463 Review Set 6C 5 b  $4.5 \text{ units}^2$

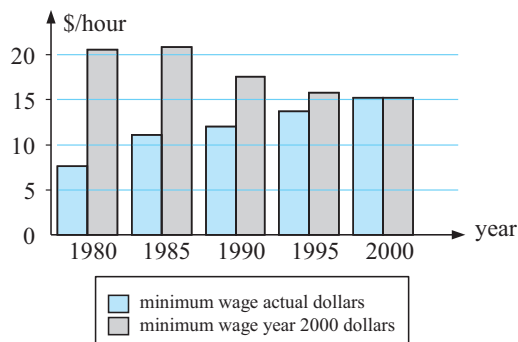
page 464 Review Set 6F 8  $m = 2$  or  $-2$

page 465 Exercise 7B.1

5 c The dot plot gives a better visualisation of the distribution than the frequency histogram. **Note:** The dot plot and the relative frequency histogram from 4e are effectively the same.

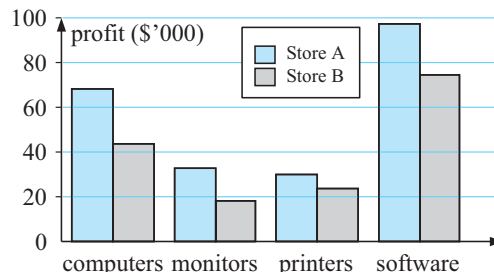
page 465 Exercise 7B.2

3 a



page 466 Exercise 7B.2

4 a



page 466 Exercise 7B.4

1 h slightly positively skewed

page 466 Exercise 7B.5

2 a Shane: range = 11,  $\bar{x} = 5.8$

3 c A low standard deviation indicates little variation from 375 mL

page 467 Exercise 7C.3 1 a "The rule is to add the two..."

page 469 Exercise 7E.1

6 c 0.8405 d 0.9957 8 b 0.8065

page 469 Exercise 7E.2

1 a Table should also include the following columns:

$x_i$	4	5	6
$P(x_i)$	0.2344	0.0938	0.0156

page 470 Exercise 7E.2

1 b The following two columns should be added to the table:

$x_i$	5	6
$P(x_i)$	0.0015	0.0001

c i The following table should be attached:

$x_i$	0	1	2	3	4	5	6
$p(x_i)$	0.0001	0.0015	0.0154	0.0819	0.2458	0.3932	0.2621

3 a

$x_i$	0	1	2	3
$P(x_i)$	$(1-p)^3$	$3p(1-p)^2$	$3p^2(1-p)$	$p^3$

page 470 Exercise 7F.3 2 b 0.5245 e 0.2488

page 470 Exercise 7F.4 1 b 0.3085

page 470 Exercise 7F.7

2 c 87.4% 4 b 0.7921 5 c 0.6045

page 470 Review Set 7A 7 c 68.7%

page 471 Review Set 7B

6 b  $k = 29.27 \therefore$  can expect that no more than 8% of batteries will fail in at most 37.13 weeks.

page 471 Review Set 7C

5 b 0.1419

6  $\Pr(x \leq 3) = 0.1469 \therefore$  out of 2000, 294 will on average need to be replaced. Profit = \$24 120

7 c median is  $x = 1.23$

page 472 Exercise 8A.3 1 b 0.7119 c 0.8215 2 0.9749

page 473 Exercise 8C.2

1 b  $z < -1.645$  2 b  $z < -2.326$

4 Final paragraph should be: Since  $z < z_\alpha$  we reject the null hypothesis. At the 2% level there is sufficient evidence to support the claim that the mean price of a bottle of wine has fallen.

6 Third line should be:  $\alpha = 0.05$ , two sided,  $z_{\frac{\alpha}{2}} = 1.96$   
Final paragraph should read: "Since  $z < -z_{\frac{\alpha}{2}}$  the null hypothesis..."

page 474 **Exercise 8C.2**

8 Third line should be:  $\alpha = 0.02$ , two sided,  $z_{\frac{\alpha}{2}} = 2.326$   
Final paragraph should be: We reject  $H_0$  if  $z < -z_{\frac{\alpha}{2}}$  or  $z > z_{\frac{\alpha}{2}}$ .  
Since  $z$  does not lie in the rejection region we do not reject the null hypothesis. There is insufficient evidence at the 2% level to accept the claim that Australian women differ from New Zealand women.

page 474 **Exercise 8C.3**

2 Delete "Since  $z > -z_{\alpha}$ , the null hypothesis is accepted."  
Replace with: We reject  $H_0$  if  $z < -z_{\frac{\alpha}{2}}$  or  $z > z_{\frac{\alpha}{2}}$ .  
Since  $z$  does not lie in the rejection region we do not reject the null hypothesis.  
4 The third line should be:  $\alpha = 0.01$ , two sided,  $z_{\alpha} = 2.576$   
Delete "Since  $z > -z_{\alpha}$ , the null hypothesis is accepted."  
Replace with: We reject  $H_0$  if  $z < -z_{\frac{\alpha}{2}}$  or  $z > z_{\frac{\alpha}{2}}$ .  
Since  $z$  does not lie in the rejection region we do not reject the null hypothesis.

page 474 **Exercise 8C.4** 5 c  $P\text{-value} = 2 \times \Pr(z \geq 1.365) \dots$

page 475 **Review Set 8A**

3 c Final paragraph should be:  
Since  $z > -z_{\alpha}$  we do not reject the null hypothesis.  
There is insufficient evidence to conclude that the purchasing officer should proceed with the purchase.

page 475 **Review Set 8B**

3 b  $0.2835 < p < 0.4113$   
6 First paragraph should be: Since  $z < z_{\alpha} \dots$   
7 First paragraph should be:  $\Pr(x \geq 38) = 0.0182 \dots$

page 476 **Review Set 8C**

7 First paragraph should be:  $\Pr(x \geq 23) = 0.0182$

page 476 **Exercise 9A.2** 3 b  $P(1) = a + b + c = 38$   
 $P(2) = 4a + 2b + c = 32$   
 $P(3) = 9a + 3b + c = 25$

page 477 **Exercise 9B**

8 b last line should read:  
solutions of the form  $x = t, y = 3 - t$

page 477 **Exercise 9C**

9 c  $2003 \div \$284000, 2005 \div \$377000$

page 477 **Exercise 9D**

5 c Unique solution if  $m \neq -5$  or  $-1$ :  
 $x = \frac{7}{m+5}, y = \frac{3(m-2)}{m+5}, z = \frac{-7}{m+5}$

page 481 **Exercise 10C.4**

8 e  $AC + AD + BC + BD$

page 483 **Exercise 10E.2**

3 a  $x = \frac{23}{10}, y = \frac{13}{10}, z = -\frac{9}{2}$   
b  $x = -\frac{1}{3}, y = -\frac{95}{21}, z = \frac{2}{21}$

**ERRATA FOR FIRST REPRINT**

**QUESTIONS**

page 108 **Example 25**

question should ask to find the equation at (1, 4) and answer should correspondingly be  $2x - y = -2$

page 120 **Exercise 4A.9**

9 d If the birth rate is 6%, the maximum carrying capacity is 24 000 and 5% is harvested, find the stable population.  
c If the harvest changes to 4%, what will the stable population increase to?

page 135 **Example 8**

a Show that  $f'(x) = \frac{-3(x-5)(x-1)}{(x-2)^2(x+1)^2}$

page 221 **Example 11**

last line of solution should be:  
Thus  $f(x) = x^4 - 2x^2 - x + 6$