MATHEMATICS FOR THE INTERNATIONAL STUDENT
MATHEMATICS HL (as at 23 April 2008)

ERRATA FOR INITIAL PRINT RUN

TEXT

page 153 **Exercise 7L**

3 $v(t)$ should be: $-\frac{1}{2}t^2 + \frac{1}{2}t + 15$

page 154 **Exercise 7L**

3 new parts **b**, **c** and **d**:
- **b** After how many seconds did the car reach its maximum velocity? Explain why this may have happened.
- **c** What was the maximum velocity reached?
- **d** How long does it take for the car to stop?

page 209 **E - Combinations**

Highlighted box should read:
$C_r^n = \frac{n(n-1)(n-2)\ldots(n-r+3)(n-r+2)(n-r+1)}{r\,(r-1)\,(r-2)\ldots\quad 3\qquad 2\qquad 1} = \frac{n!}{r!(n-r)!}$

page 446 **Example19**

b missing $=$ sign in calculation of **n**:
$\mathbf{n} = \ldots = \begin{bmatrix} -1 \\ -10 \\ -6 \end{bmatrix} = -\begin{bmatrix} 1 \\ 10 \\ 6 \end{bmatrix}$

page 516 **Exercise 19H**

4 calculator instructions for **b** should use binomcdf, i.e., in **b** $P(X \leqslant 3) =$ binomcdf(5, 0.9, 3)

ANSWERS

page 780 **Exercise 7L**

3 new answers corresponding to new question:
- **a** 15 m/s
- **b** $\frac{1}{2}$ sec.; since the car was travelling downhill, it was accelerating. $\therefore$ when the break was applied, the speed of the vehicle still increased for a short time.
- **c** $15\frac{1}{8}$ m/s
- **d** 6 seconds

page 796 **Exercise 14N**

3 b i $\mathbf{P}^n = \begin{bmatrix} n+1 & n \\ -n & 1-n \end{bmatrix}$ for all $n \in Z^+$

ERRATA FOR FIRST REPRINT

TEXT

page 276 **Exercise 13C**

4 Question should finish:
...time difference between high tides is about 12.4 hours.

page 302 **Exercise 13N**

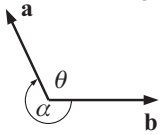
8 f $\frac{(1-\cot\theta)^2}{\csc^2\theta} + \sin 2\theta = 1$

page 303 **Exercise 13O**

5 RHS of equation should be: $\frac{1-\cos 2n\theta}{2\sin\theta}$

page 384 **Exercise 15J.1**

1 There is a diagram missing next to the blue highlighted box.



page 642 **Exercise 24C.1**

4 question should read:
...to show that $\arctan(5) - \arctan(\frac{2}{3}) = \frac{\pi}{4}$

page 644 **Exercise 24D**

3 radius of lake should be 2 km, not 4 km.

page 649 **Exercise 24E**

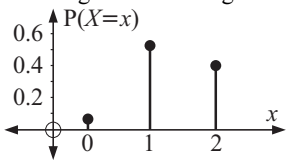
16 the wheel rotates in a clockwise direction

page 726 **Review Set 29A**

3 ...deduce that $y = \sqrt{2x+4} - 2$

page 732 **Example 4**

The diagram is missing some labels:



page 738 **Property of Var(X)**

Highlighted text should be:
$\text{Var}(x) = \text{E}(X^2) - \{\text{E}(X)\}^2$ i.e., $\text{Var}(X) = \text{E}(X^2) - \mu^2$

page 740 **Exercise 30E.2**

1 Question should finish:
...standard deviation of the Y distribution.

ANSWERS

page 764 **Review Set 1A**

2 b iv no

page 765 **Exercise 2D**

14 £53 519.29

page 766 **Review Set 2A**

9 $u_n = \frac{1}{6} \times 2^{n-1}$ or $-\frac{1}{6} \times 2^{n-1}$

page 767 **Exercise 3G**

5 d label on graph should be: $y = 3 - 2^{-x}$

page 767 **Exercise 3H**

4 a 12 bears
b 146 bears

page 767 **Exercise 3I**

4 yes

page 768 **Exercise 4A**

6 d $-\frac{1}{2}$

page 769 **Exercise 4E**

2 b 221 min
5 15.8^oC

page 769 **Exercise 4F**

1 6.17 years, i.e., 6 years 62 days

page 770 **Exercise 5A**

13 a i 64.6 amps

page 770 **Exercise 5C**

4 c $\sqrt{x}$
f $\frac{1}{\sqrt[3]{g}}$

page 775 **Exercise 6E**

2 b Vertically stretch, factor $\frac{1}{6}$ then translate by $\begin{bmatrix} -1 \\ -2 \end{bmatrix}$.

page 777 **Exercise 7B.2**

4 b i vertex of $(2, -4)$ should be marked on graph

page 780 **Exercise 7H**

6 g iv graph x-intercepts are: -4 and -2
i iv graph x-intercepts are: $4 - 2\sqrt{5}$ and $4 + 2\sqrt{5}$

page 780 **Exercise 7I.1**

2 **a**, **b**, **d**, **f**

page 783 **Exercise 8G.1**

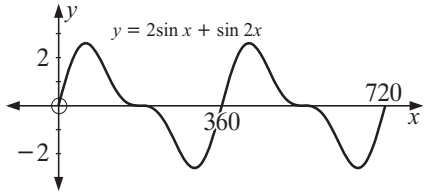
3 c should be: For $x \in]-\infty, 0[$ or $]0.627, \infty[$

page 786 **Exercise 11D.1**

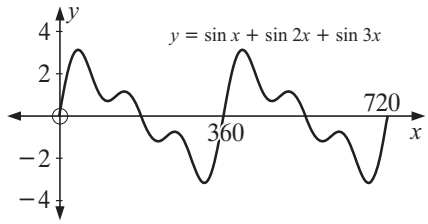
3 b AP $= \frac{\pi}{3}$

page 788 **Exercise 13B.1**

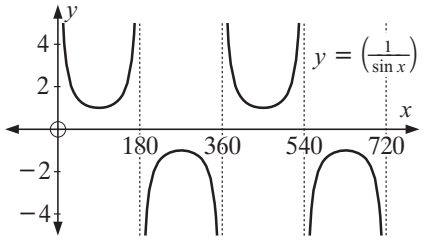
5 a



b



c



page 788 **Exercise 13C**

1 a $T \doteqdot 6.5 \sin \frac{\pi}{6}(t - 4.5) + 20.4$

2 a $T \doteqdot 4.5 \sin \frac{\pi}{6}(t - 4.5) + 11.5$

4 a $H \doteqdot 7 \sin 0.507(t - 6.2)$

page 791 **Exercise 13K.2**

1 j 1

page 791 **Exercise 13O**

1 b $\frac{1}{1-\sin x}$ as $-1 \leqslant \sin x \leqslant 1$

2 c $\frac{\sin 2nx}{2 \sin x}$

page 792 **Review Set 13A**

5 $T \doteqdot 7.05 \sin \frac{\pi}{6}(t - 4.5) + 24.75$

10 c $0.5 < t < 2.5$ and $6.5 < t < 8$

page 792 **Exercise 14B**

4 c
$$\begin{bmatrix} 0.07 \\ 0.90 \\ 0.41 \\ -0.28 \\ -0.05 \end{bmatrix}$$

page 794 **Exercise 14L**

4 c $x = 2,\ y = 4,\ z = -1$

page 798 **Exercise 15E.1**

2 a $\overrightarrow{AB} = \begin{bmatrix} 4 \\ -1 \\ -3 \end{bmatrix}$, $\overrightarrow{BA} = \begin{bmatrix} -4 \\ 1 \\ 3 \end{bmatrix}$

page 798 **Exercise 15G**

4 b parallelogram

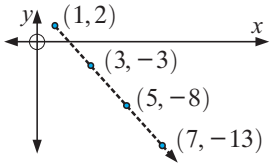
c not parallelogram

page 800 **Review Set 15B**

1 c $\sqrt{61}$ units

page 802 **Exercise 17A.1**

4 b



page 804 **Exercise 17F**

1 b i $a_1 = ka_2,\ b_1 = kb_2,\ c_1 = kc_2$ for some k

ii $a_1 = ka_2,\ b_1 = kb_2,\ c_1 = kc_2,\ d_1 = kd_2$ for some k

page 804 **Review Set 17A**

7 a X23, $x_1 = 2 + t,\ y_1 = 4 - 3t,\ t \geqslant 0$

b Y18, $x_2 = 9 - t,\ y_2 = 3 + 2a + at,\ t \geqslant 0$

c interception occurred at 2:20:30 pm

d $\theta = 192^o$, $\doteqdot 4.82$ km/min

page 805 **Exercise 18B.1**

4 a mean: 3.19, median: 0, mode: 0

page 806 **Exercise 18C**

4 b 36

c i 0.527

ii 0.030

page 806 **Exercise 18D.1**

5 a iv 7

v 2

page 807 **Exercise 18F**

1 a 4.97

page 809 **Exercise 19I**

11 b P(A or B) = P(A) + P(B) − P(A and B)

page 810 **Exercise 19L**

1 $\doteqdot 0.655$

5 a $\frac{2}{5}$

page 810 **Exercise 20A.1**

1 a 96.2 km/h

page 811 **Exercise 21D**

1 n $8x - 4$

3 c $2x - 10$

page 812 **Exercise 22A**

3 f 5.777

page 812 **Exercise 22C.1**

3 units should be cm/s^2, not m/s^2

page 815 **Exercise 22F**

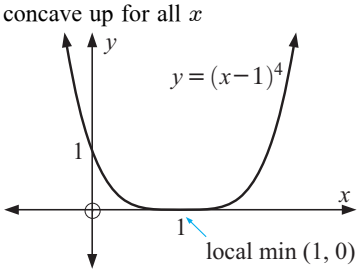
2 f i local min. at (1, 0)

ii no points of inflection

iii increasing for $x \geqslant 1$, decreasing for $x \leqslant 1$

iv concave up for all x

v



page 816 **Exercise 22G**

14 between A and N, 2.578 m from N

page 817 **Review Set 22A**

5 a base is 1.26 m square, height 0.630 m

page 818 **Exercise 23D**

13 c as $t \to \infty$, $v(t) \to 100$ cm/s (below)

page 818 **Review Set 23A**

1 c $3x^2 + y^4 + 4xy^3 \frac{dy}{dx} = e^y + xe^y \frac{dy}{dx}$

page 819 **Exercise 24A**

3 a $2x\cos(x^2)$

b $-\frac{1}{2\sqrt{x}}\sin(\sqrt{x})$

c $-\frac{\sin x}{2\sqrt{\cos x}}$

d $2\sin x\cos x$

e $-3\sin x\cos^2 x$

f $-\sin x\sin(2x) + 2\cos x\cos(2x)$

g $\sin x\sin(\cos x)$

h $-12\sin(4x)\cos^2(4x)$

i $-\frac{\cos x}{\sin^2 x}$

j $\frac{2\sin(2x)}{\cos^2(2x)}$

k $-\frac{8\cos(2x)}{\sin^3(2x)}$

l $\frac{-12}{\cos^2(\frac{x}{2})\tan^4(\frac{x}{2})}$

7 a rising

b rising at 2.731 m per hour

page 819 **Review Set 24B**

2 i $\frac{-\sqrt{x}\csc^2 x - \frac{1}{2}x^{-\frac{1}{2}}\cot x}{x} \equiv -\frac{\cos x\sin x + 2x}{2x\sqrt{x}\sin^2 x}$

page 820 **Exercise 24E**

16 b 100π radians per second

page 820 **Review Set 24A**

5 b increasing for $\frac{3\pi}{2} < x < 2\pi$, decreasing for $0 < x < \frac{\pi}{2}$

page 822 **Exercise 26B**

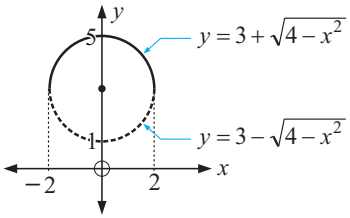
2 b $45\frac{3}{4}$ units^2

page 824 **Exercise 28A.1**

6 b $\frac{1024\pi}{5}$ units^3

page 824 **Exercise 28B**

5 b



c $\doteq 237$ units^3

page 825 **Exercise 29D.3**

4 $y = Axe^{2x^2}$

page 825 **Review Set 29B**

2 b $\sqrt{x^2-4} + 2\arccos(\frac{2}{x}) + c$

page 825 **Exercise 30A**

2 a ii $0 \leqslant x \leqslant 200$ mm

page 826 **Exercise 30B**

5 a

roll 1 \ roll 2	1	2	3	4	5	6
6	(6, 1)	(6, 2)	(6, 3)	(6, 4)	(6, 5)	(6, 6)
5	(5, 1)	(5, 2)	(5, 3)	(5, 4)	(5, 5)	(5, 6)
4	(4, 1)	(4, 2)	(4, 3)	(4, 4)	(4, 5)	(4, 6)
3	(3, 1)	(3, 2)	(3, 3)	(3, 4)	(3, 5)	(3, 6)
2	(2, 1)	(2, 2)	(2, 3)	(2, 4)	(2, 5)	(2, 6)
1	(1, 1)	(1, 2)	(1, 3)	(1, 4)	(1, 5)	(1, 6)

page 827 **Exercise 30F**

4 b $\doteq 0.00246$

page 827 **Exercise 30H**

4 b $\doteq 0.392$

page 827 **Exercise 30J.1**

3 c 2.15%, 95.4%

page 828 **Exercise 30K.1**

3 b 0.524

page 828 **Exercise 30K.3**

2 c $k \doteq -1.089$

ERRATA FOR SECOND REPRINT

TEXT

page 37 **Opening Problem**

The opening paragraph should read:

"A circular stadium consists of sections as illustrated, with aisles in between. The diagram shows the tiers of concrete for the final section, **Section K**. Seats are to be placed along every concrete step, with each seat being 0.45 m wide. AB, the arc at the front of the first row is 14.4 m long, while CD, the arc at the back of the back row is 20.25 m long."

The angle 32^o in the diagram should be removed.

page 53 **Exercise 2G**

8 last paragraph should be:
"At the end of the first quarter the amount owed, A_1, is given by $\$8000 \times 1.03 - R$, where R is the amount of each repayment."

ERRATA FOR THIRD REPRINT

TEXT

page 392 **Length of a $\times$ b proof**

The top line of the page should read:

$=(a_1{}^2 + a_2{}^2 + a_3{}^2)(b_1{}^2 + b_2{}^2 + b_3{}^2) - (a_1b_1 + a_2b_2 + a_3b_3)^2$

page 392 **Exercise 15K.2**

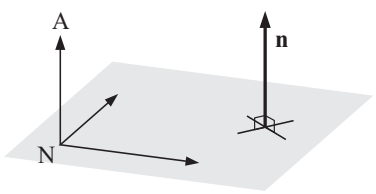
5 c question should finish:
... prove that $\mathbf{a} + \mathbf{b} = k\mathbf{c}$ for some scalar k.

page 436 **Exercise 17B.3**

3 a question should be:
Find in terms of **i** and **j** and velocity vector of the liner.

page 447 **Example 21**

diagram should be:



page 578 **Exercise 22B**

6 b 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?

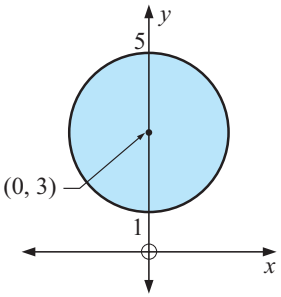
page 699 **Definite integrals**

Integral in **Fundamental Theorem of Calculus** definition should be:

$\int_a^b f(x)\,dx = F(b) - F(a)$

page 709 **Exercise 28B**

5 diagram should be:



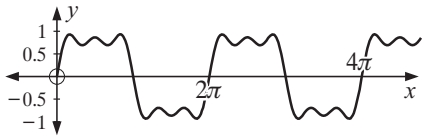
ANSWERS

page 776 **Review set 6A**

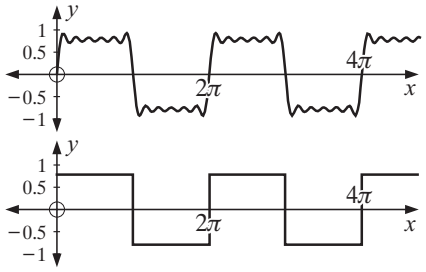
4 c ii 0.9

page 788 **Exercise 13B.1**

6 a



b



page 803 **Exercise 17B.4**

1 a Points B and C should be swapped in the diagram.

ERRATA FOR FOURTH REPRINT

TEXT

page 433 **Exercise 17B.2**

2 b question should finish:
... velocity reaches (18, 21) in 10 seconds

4 d question should start:
If they start at 6:00 am, find the time...

ANSWERS

page 803 **Exercise 17B.2**

2 b $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 6 \end{bmatrix} + \frac{t}{2.5}\begin{bmatrix} 20 \\ 15 \end{bmatrix}, t \in \mathbb{R}$

4 d 10:12 am

ERRATA FOR FIFTH REPRINT

TEXT

page 94 **Review set 4A**

2 c $\log\left(10^a \times 10^{b+1}\right)$

page 701 **Exercise 27D**

2 The region is defined for $x \geqslant 0$.

ANSWERS

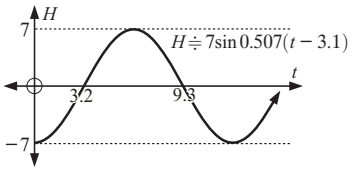
page 788 **Exercise 13C**

1 a $T \div 6.5 \sin \frac{\pi}{6}(t - 4.5) + 20.5$

2 a $T \div 4.5 \sin \frac{\pi}{6}(t - 10.5) + 11.5$

4 a $H \div 7 \sin \frac{\pi}{6}(t - 3.1)$

b



page 792 **Review set 13A**

5 $T \div 7.05 \sin \frac{\pi}{6}(t - 10.5) + 24.75$

page 793 **Exercise 14E.2**

5 b $\begin{bmatrix} 78\,669.5 \\ 65\,589 \end{bmatrix}$ income from day 1
income from day 2

page 803 **Exercise 17B.2**

2 b $\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 6 \end{bmatrix} + \frac{t}{10}\begin{bmatrix} 20 \\ 15 \end{bmatrix}$

page 810 **Exercise 19L**

5 a $\frac{1}{10}$

page 817 **Exercise 23C**

2 h $\frac{1}{x \ln x}$

page 825 **Exercise 29B**

1 e $2\sqrt{x-1} - 2\arctan\left(\sqrt{x-1}\right) + c$