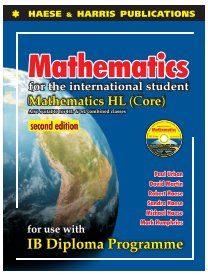


ERRATA

MATHEMATICS FOR THE INTERNATIONAL STUDENT

MATHEMATICS HL (CORE) (2nd edition)

Second edition - 2010 reprint

page 95 **TEXT** last paragraph on the page should read:

e is a special number in mathematics. It is irrational like π, and just as π is the ratio of a circle's circumference to its diameter, e also has a physical meaning. We explore this meaning in the following investigation.

page 484 **THE PEA PROBLEM With fertiliser** (insert 7 before last 11)

6 7 7 4 9 5 5 5 8 9 8 9 7 7 5 8 7 6 6 7 9 7 7 7 8 9 3 7 4 8 5 10 8 6 7 6 7 5 6 8
7 9 4 4 9 6 8 5 8 7 7 4 7 8 10 6 10 7 7 7 9 7 7 8 6 8 6 8 7 4 8 6 8 7 3 8 7 6 9 7
6 9 7 6 8 3 9 5 7 6 8 7 9 7 8 4 8 7 7 7 6 6 8 6 3 8 5 8 7 6 7 4 9 6 6 6 8 4 7 8
9 7 7 4 7 5 7 4 7 6 4 6 7 7 6 7 8 7 6 6 7 8 6 7 10 5 13 4 7 11

page 859 **ANSWERS EXERCISE 1F.3**

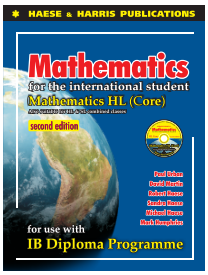
1 **a** $x \in]-4, 4[$

page 924 **ANSWERS REVIEW SET 25B**

6 **b** as $x \to \infty$, $f(x) \to 0$ (above)
as $x \to -\infty$, $f(x) \to 0$ (below)

page 930 **ANSWERS EXERCISE 30**

74 Either A or B must occur, or A and B are disjoint.



ERRATA

MATHEMATICS FOR THE INTERNATIONAL STUDENT

MATHEMATICS HL (CORE) (2nd edition)

Second edition - 2009 reprint

page 55 **OPENING PROBLEM** change second sentence

A circular stadium consists of sections as illustrated, with aisles in between. The diagram shows the 13 tiers of concrete steps 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.

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e is a special number in mathematics. It is irrational like π, and just as π is the ratio of a circle's circumference to its diameter, e also has a physical meaning. We explore this meaning in the following investigation.

page 96 **INVESTIGATION 2**

5 You should have discovered that for very large a values,

$$\left(1+\frac{1}{a}\right)^a \approx 2.718\,281\,828\,459.....$$

page 122 **REVIEW SET 4A**

2 Without using a calculator, find: **a** $\log\sqrt{10}$ **b** $\log\dfrac{1}{\sqrt[3]{10}}$ **c** $\log(10^a \times 10^{b+1})$

page 232 **REVIEW SET 8B**

4 Expand and simplify $(\sqrt{3}+2)^5$ giving your answer in the form $a+b\sqrt{3}$, $a, b \in \mathbb{Z}$.

page 246 **REVIEW SET 9C**

6 If $u_1 = 5$ and $u_{n+1} = 2u_n - 3(-1)^n$, then $u_n = 3(2^n) + (-1)^n$, $n \in \mathbb{Z}^+$.

page 290 **EXAMPLE 2** the speech bubble should read:

As $\sin 2x$ has half the period of $\sin x$, the first maximum is at $\frac{\pi}{4}$ not $\frac{\pi}{2}$.

page 328 **SUMMARY** change second dot point:

Summary:

- $\mathbf{A} \pm \mathbf{B} = (a_{ij}) \pm (b_{ij}) = (a_{ij} \pm b_{ij})$
- We can only add or subtract matrices of the same order.
- We add or subtract corresponding elements.
- The result of addition or subtraction is another matrix of same order.

page 335 **NOTE** should read:

Note: The product **AB** exists *only* if the number of columns of **A** equals the number of rows of **B**.

page 354 **TEXT following the third blue box** should read:

For example, suppose we replace the second equation by "twice the second equation minus the first equation". In this case:

page 396 **EXERCISE 14F.1**

15 If $\mathbf{a} = \begin{pmatrix} -1 \\ 1 \\ 3 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} 1 \\ -3 \\ 2 \end{pmatrix}$ and $\mathbf{c} = \begin{pmatrix} -2 \\ 2 \\ 4 \end{pmatrix}$ find: **d** $|\mathbf{a} - \mathbf{c}|$

page 484 **THE PEA PROBLEM With fertiliser** (insert 7 before last 11)

6 7 7 4 9 5 5 5 8 9 8 9 7 7 5 8 7 6 6 7 9 7 7 7 8 9 3 7 4 8 5 10 8 6 7 6 7 5 6 8
7 9 4 4 9 6 8 5 8 7 7 4 7 8 10 6 10 7 7 7 9 7 7 8 6 8 6 8 7 4 8 6 8 7 3 8 7 6 9 7
6 9 7 6 8 3 9 5 7 6 8 7 9 7 8 4 8 7 7 7 6 6 8 6 3 8 5 8 7 6 7 4 9 6 6 6 8 4 7 8
9 7 7 4 7 5 7 4 7 6 4 6 7 7 6 7 8 7 6 6 7 8 6 7 10 5 13 4 7 11

page 643 **EXAMPLE 10** the third line from the bottom should read:

Cuts the y-axis when $x = 0$

page 728 **TEXT** the first line on the page should read:

For example, • $\sin^2(3x - \frac{\pi}{2})$ becomes $\frac{1}{2} - \frac{1}{2}\cos(6x - \pi)$

page 904 **ANSWERS EXERCISE 17F.1**

10 **a** 0.809 **b** 0.150

page 907 **ANSWERS REVIEW SET 18B**

8 **b** **i** $\frac{216}{625}$

page 930 **ANSWERS EXERCISE 30**

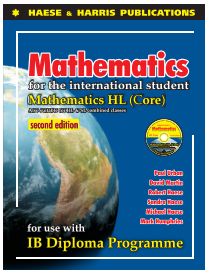
34 **a** $A = 1, \quad B = 0, \quad C = -1$ **b** $\frac{1}{2}\ln 7 - \frac{3}{2}\ln 3$

74 Either A or B must occur, or A and B are disjoint.

75 **b** ≈ 3.82 units

page 931 **ANSWERS EXERCISE 30**

116 **b** $\approx 0.001\,72$



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page 80 **EXERCISE 3B** (note also correction to answer)

1 Simplify, then use a calculator to check your answer:

k $(-5)^4$

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page 119 **EXAMPLE 26**

b Using the same graphs as above, we seek values of x for which $f(x) - g(x) \geqslant 0$.

page 122 **REVIEW SET 4A**

2 Without using a calculator, find: **a** $\log\sqrt{10}$ **b** $\log\dfrac{1}{\sqrt[3]{10}}$ **c** $\log(10^a \times 10^{b+1})$

page 232 **REVIEW SET 8B**

4 Expand and simplify $(\sqrt{3}+2)^5$ giving your answer in the form $a+b\sqrt{3}$, $a, b \in \mathbb{Z}$.

page 243 **EXERCISE 9B**

14 Prove the following propositions to be true using the principle of mathematical induction:

a $3^n \geqslant 1+2n$ for all $n \in \mathbb{Z}$, $n \geqslant 0$

page 246 **REVIEW SET 9C**

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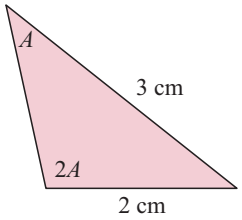
page 317 **EXERCISE 12K** diagram should be:

12 **b**



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page 484 **THE PEA PROBLEM With fertiliser** (insert 7 before last 11)

6 7 7 4 9 5 5 5 8 9 8 9 7 7 5 8 7 6 6 7 9 7 7 7 8 9 3 7 4 8 5 10 8 6 7 6 7 5 6 8
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9 7 7 4 7 5 7 4 7 6 4 6 7 7 6 7 8 7 6 6 7 8 6 7 10 5 13 4 7 11

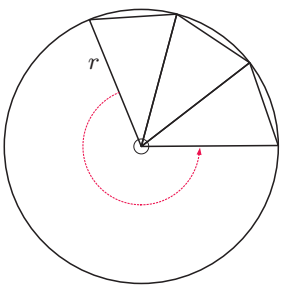
page 573 **EXERCISE 19A**

1 Evaluate the limits:

o $\lim\limits_{x \to -5} \dfrac{2x^2 - 50}{3x^2 + 13x - 10}$

page 578 **EXERCISE 19C** diagram should be:

2



page 619 **REVIEW SET 20B**

10 Use the product rule for differentiation to prove that:

a if $y = uv$ where u and v are functions of x, then

$$\frac{d^2y}{dx^2} = \left(\frac{d^2u}{dx^2}\right)v + 2\frac{du}{dx}\frac{dv}{dx} + u\left(\frac{d^2v}{dx^2}\right)$$

page 643 **EXAMPLE 10** the third line from the bottom should read:

Cuts the y-axis when $x = 0$

page 682 **EXERCISE 22D**

23 Consider the function $f(x) = e^{-x}(x + 2)$.

b Conjecture a formula for finding $f^{(n)}(x)$, $n \in \mathbb{Z}^+$.

page 721 **EXERCISE 24D**

1 Find: **f** $\displaystyle\int \frac{10}{\sqrt{1-5x}}\,dx$

page 728 **TEXT** the first line on the page should read:

For example, • $\sin^2(3x - \frac{\pi}{2})$ becomes $\frac{1}{2} - \frac{1}{2}\cos(6x - \pi)$

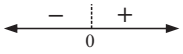
page 846 **EXERCISE 30**

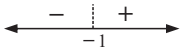
127 **a** Show that for all positions of P,
$\dfrac{d\phi}{d\theta} = \dfrac{-b\cos^2\phi}{a\cos^2\theta}$.

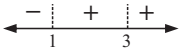
page 856 **EXERCISE 30**

225 **f** Find the exact value of k if $k > 0$ and the region bounded by $y = f(x)$, the x-axis, and the line $x = k$ has area equal to $\frac{1}{4}(e - 1)$ units^2.

page 858 **ANSWERS EXERCISE 1D**

4 **n** 

o 

r 

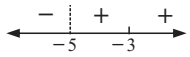
page 859 **ANSWERS EXERCISE 1F.3**

1 **a** $x \in]-4, 4[$
c $x \in [-4, -2]$

page 861 **ANSWERS REVIEW SET 1A**

5 **b** $4x^2 - 12x + 11$

page 862 **ANSWERS REVIEW SET 1B**

5 **b** 

page 863 **ANSWERS EXERCISE 2D.1**

7 **c** $u_n = 3 \times (\pm\sqrt{2})^{n-1}$ **d** $u_n = 10 \times (\pm\sqrt{2})^{1-n}$

page 863 **ANSWERS EXERCISE 2E.1**

5 **b** $\displaystyle\sum_{k=1}^{n}(k+1)(k+2) = \frac{n(n^2+6n+11)}{3}$

page 863 **ANSWERS REVIEW SET 2A**

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

page 863 **ANSWERS EXERCISE 3B**

1 **h** -32 **i** -32 **j** -64 **k** 625 **l** -625
2 **a** $16\,784$ **b** 2401 **c** -3125 **d** -3125 **e** $262\,144$
f $262\,144$ **g** $-262\,144$ **h** $902.436\,039\,6$
i $-902.436\,039\,6$ **j** $-902.436\,039\,6$
3 **a** $0.\overline{1}$ **b** $0.\overline{1}$ **c** $0.02\overline{7}$ **d** $0.02\overline{7}$
e $0.012\,345\,679$ **f** $0.012\,345\,679$ **g** 1 **h** 1

page 864 **ANSWERS EXERCISE 3B**

4 3 **5** 7

page 868 **ANSWERS EXERCISE 4H.2**

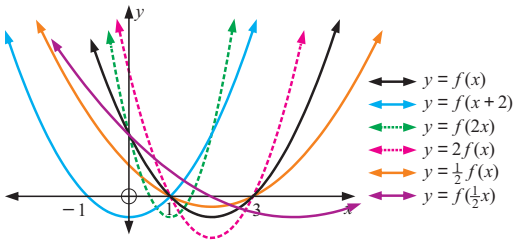
4 **4** 8.64 years

page 869 **ANSWERS REVIEW SET 4D**

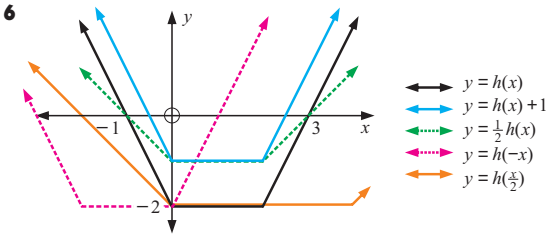
9 **b** $f^{-1}(x) = \dfrac{4}{e^x - 1}$, $0 < x < \ln 2$

page 872 **ANSWERS EXERCISE 5B.4** diagrams should be:

4



6



page 874 **ANSWERS REVIEW SET 5A**

10 **b** **i** $(1, 3) \to (1, 6) \to (\frac{1}{2}, 6) \to (1, 6) \to (1, 3)$

page 878 **ANSWERS EXERCISE 6G**

15 554 km h^{-1}

page 878 **ANSWERS EXERCISE 6H**

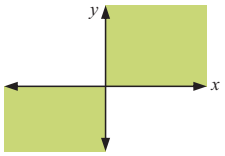
13 $f(x) = x^4 - 2(a^2 + b^2)x^2 + (a^2 - b^2)^2$,
least value $= -4a^2b^2$

page 883 **ANSWERS EXERCISE 10D**

1 **c** 28.3 cm^2

page 883 **ANSWERS REVIEW SET 10C** diagram should be:

2



page 887 **ANSWERS EXERCISE 12I**

2 **d** $-2\sin^2\alpha$

page 888 **ANSWERS EXERCISE 12K**

8 **b** $\frac{4\sqrt{2}}{7}$

page 888 **ANSWERS REVIEW SET 12A**

10 **c** $0.5 < t < 2.5$ and $6.5 < t \leqslant 8$

page 890 **ANSWERS EXERCISE 13C.3**

3 **c** $(\mathbf{A}^{-1})^{-1} = \mathbf{A}$

page 894 **ANSWERS EXERCISE 14B.3**

1 **b** 9.93^o east of south

page 895 **ANSWERS EXERCISE 14I**

3 **b** 94.1^o

page 897 **ANSWERS REVIEW SET 14E**

12 **a** $t = -4$ **b** $\overrightarrow{LM} = \begin{pmatrix} 5 \\ -3 \\ -4 \end{pmatrix}$, $\overrightarrow{KM} = \begin{pmatrix} -2 \\ -2 \\ -1 \end{pmatrix}$

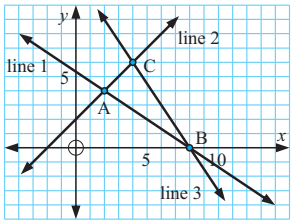
So, $\overrightarrow{LM} \bullet \overrightarrow{KM} = 0 \quad \therefore \quad \widehat{M} = 90^o$

page 898 **ANSWERS EXERCISE 15A.2**

5 $a = 11, b = -7$

page 900 **ANSWERS EXERCISE 16B.2** diagram should be:

1 a



b A(2, 4), B(8, 0), C(4, 6)

c BC = BA $= \sqrt{52}$ units
$\therefore$ isosceles Δ

page 902 **ANSWERS REVIEW SET 16D**

1 b $14x - 34y - z = -11$, ≈ 2.42 units

page 902 **ANSWERS EXERCISE 17A**

1 c The modal class is 185-190 cm, as this occurred the most frequently.

page 903 **ANSWERS EXERCISE 17C**

3 b ≈ 87 students

5 b $\approx 69\%$

page 904 **ANSWERS EXERCISE 17F.1**

1 a Sample A

b, **c**

	A	B
$\overline{x}$	8	8
s	2	1.06

2 a

	$\overline{x}$	s
Andrew	25	4.97
Brad	30.5	12.6

b Andrew

10 a 0.809 **b** 0.150

page 905 **ANSWERS REVIEW SET 17A**

2 e ii 83.1 m

page 906 **ANSWERS EXERCISE 18D.2**

4 a $\frac{4}{7}$ **b** $\frac{2}{7}$

page 907 **ANSWERS EXERCISE 18J**

6 Hint: Show $P(A' \cap B') = P(A')\,P(B')$ using a Venn diagram and $P(A \cap B)$

page 907 **ANSWERS REVIEW SET 18B**

8 b i $\frac{216}{625}$

page 914 **ANSWERS EXERCISE 21E**

4 d ii $f'(x) = \dfrac{x^2(x^2-3)}{(x+1)^2(x-1)^2}$, local max. at $(-\sqrt{3}, \frac{-3\sqrt{3}}{2})$, local min. at $(\sqrt{3}, \frac{3\sqrt{3}}{2})$, horizontal inflection at $(0, 0)$

4 d iii x-intercept is 0, y-int. is 0

page 918 **ANSWERS EXERCISE 22D**

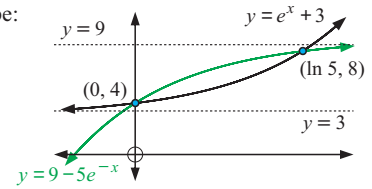
7 $\approx 63.43^o$

page 919 **ANSWERS EXERCISE 22E**

2 a ii Show that $f''(t) = Abe^{-bt}(bt-2)$

page 919 **ANSWERS REVIEW SET 22A**

3 diagram should be:



4 c $f'(x) < 0$ for $x < 1$ and $1 < x \leqslant 2$ and $f'(x) > 0$ for $x \geqslant 2$.
$f''(x) > 0$ for $x > 1$, $f''(x) < 0$ for $x < 1$.
So, the gradient of the curve is negative for all defined values of $x \leqslant 2$ and positive for all $x \geqslant 2$. The curve is concave down for $x < 1$ and concave up for $x > 1$.

9 Tangent is $y = \ln 3$, so never cuts x-axis.

2 $(0,\ \ln 4 - 1)$

5 c $\dfrac{dy}{dx} = -\dfrac{1}{\sqrt{a^2 - x^2}}, \quad x \in]-a,\ a[$

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

10 $A = 1,\ B = 2,\ C = 1,\ D = 4, \quad \dfrac{(x+1)^3}{3} + 4\ln|x-2| + c$

13 $\dfrac{\cos^{1-\frac{n}{2}} x}{\frac{n}{2} - 1} + c$, for $n \neq 2$, $\quad -\ln|\cos x| + c$, for $n = 2$

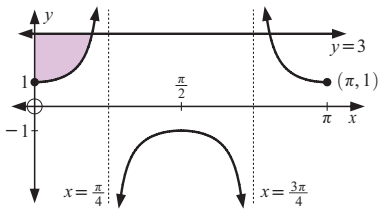
1 b $63\frac{3}{4}$ units^2

2 b 16 km

8 3.82020 units

11 $\left(2 - \frac{\pi}{2}\right)$ units^2

13 b i diagram should be:



6 b as $x \to \infty,\ f(x) \to 0$ (above)
as $x \to -\infty,\ f(x) \to 0$ (below)

1 h $\frac{40\pi}{3}$ units^3

2 c $k \approx -1.088$

4 a $k \approx 79.1$ **b** $k \approx 31.3$

34 a $A = 1, \quad B = 0, \quad C = -1$ **b** $\frac{1}{2}\ln 7 - \frac{3}{2}\ln 3$

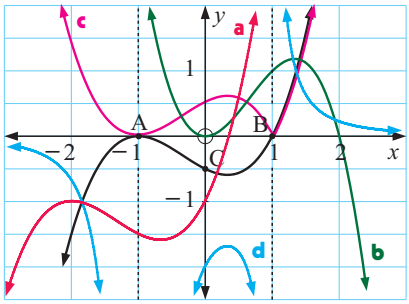
42 b $2\left|\cos(\frac{\theta-\phi}{2})\right|, \quad \frac{\theta+\phi}{2}$

74 Either A or B must occur, or A and B are disjoint.

75 b ≈ 3.82 units

116 **b** $\approx 0.001\,72$

155 diagram should be:



162 **d** $x = -2 - 4t, \quad y = t, \quad z = 1 + 2t, \quad t \in \mathbb{R}$

228 $a = 8 \quad b = 25 \quad c = 26 \quad z \geqslant -2$

229 **b** $x \approx -0.571, \quad t \approx 0.476$