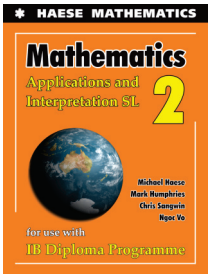


ERRATA

Mathematics: Applications and Interpretation SL

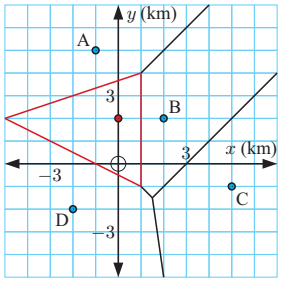
First edition - 2022 third reprint

The following errata were made on 28/Mar/2025

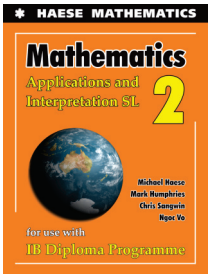
page 500 **ANSWERS EXERCISE 17C** Question **6 b** parts **i** and **iii**, should read:

6 **a** **i** polling booth A **ii** polling booth D

b **i**



ii cell C **iii** 15 km^2



ERRATA

Mathematics: Applications and Interpretation SL

First edition - 2020 first reprint

The following erratum was made on 03/Mar/2021

page 428 **CHAPTER 17 EXAMPLE 5** Question, should read::

Redraw this Voronoi diagram with an additional site at E$(-2,\ 1)$.

The following erratum was made on 21/Sep/2020

page 443 **ANSWERS REVIEW SET 1B** Question **6 b**, should read:

6 **a** $14.85\text{ s} < t < 14.95\text{ s}$ **b** $6.69\text{ m s}^{-1} < s < 6.73\text{ m s}^{-1}$

The following erratum was made on 16/Sep/2020

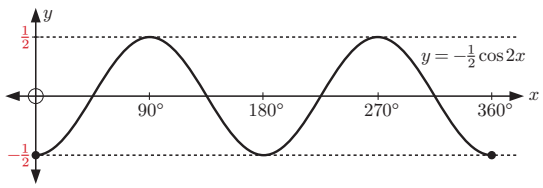
page 426 **CHAPTER 17 EXAMPLE 4** Solution, last line should read:

If we draw lines (AX) and (DX) through A and D respectively, their intersection must be point X. We observe that X has coordinates $(-3,\ -1)$.

The following erratum was made on 08/Sep/2020

page 478 **ANSWERS REVIEW SET 9B** Question **9 d**, should read:

9 **d**



The following errata were made on 11/Aug/2020

page 181 **REVIEW SET 7B** Question **9**, first sentence should read:

9 Kelly makes glass regular pyramids of height h cm with equal edge lengths. She suspects that the volume of glass V cm^3 she uses is directly proportional to a power of h, so $V \propto h^n$. A table of volumes for various heights is shown below.

page 290 **EXERCISE 12A.1** Question **7**, should read:

7 Joseph starts to pump air in his bicycle tyre. From the time 1 second after he starts pumping, the volume of air in the tyre is given by $V = -\dfrac{1200}{t} + 1380$ cm^3, $t \geqslant 1$.

a Find $\dfrac{dV}{dt}$ and state its units.

b At what rate is air being pumped into the tyre after:

i 2 seconds **ii** 6 seconds?

c Graph $V(t)$.

d Discuss what happens to $\dfrac{dV}{dt}$ as time increases.

page 401 **CHAPTER 16 ACTIVITY 1** Frequency table data, should read:

What to do:

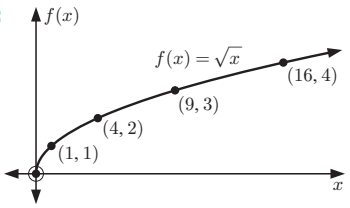
Consider a multiple choice quiz with 10 questions. Each question has 4 choices, only 1 of which is correct.

The quiz is given to 150 people, and the number of correct answers for the participants is summarised in the table alongside.

Number of correct answers	*Frequency*
0	6
1	13
2	33
3	45
4	30
5 or more	23

page 444 **ANSWERS EXERCISE 3C** Question **5 c**, diagram should be:

5 **c**



d $\{y \mid y \geqslant 0\}$

page 444 **ANSWERS EXERCISE 3D** Questions **1 b ii** and **2 b**, should read:

1 **a** -12

b **i** ≈ -1.05, 1.84, and 6.20

ii min. turning point $(0.225, -12.3)$,
max. turning point $(4.44, 25.1)$

2 **a** x-intercepts are ≈ -1.12 and ≈ 3.60, y-intercept is -5

b max. turning point $(0.688, -3.54)$,
min. turning point $(-0.402, -5.76)$ and $(2.71, -15.2)$

c as $x \to \infty$, $y \to \infty$; as $x \to -\infty$, $y \to \infty$

page 446 **ANSWERS EXERCISE 3D** Question **4 m iv**, should read:

4 **m** **iv** Domain is $\{x \mid -5 \leqslant x \leqslant 5,\ x \neq -2\}$,
Range is $\{y \mid y \leqslant \frac{1}{3}\}$

page 468 **ANSWERS REVIEW SET 7B** Question **9 a**, replace with:

9 **a** If the height of a regular pyramid increases, then each side length also increases. This means the pyramid gets larger in all 3 dimensions as the height increases, so we should expect that V is directly proportional to h^3.

page 470 **ANSWERS EXERCISE 8C** Question **8 h iv**, diagram should read:

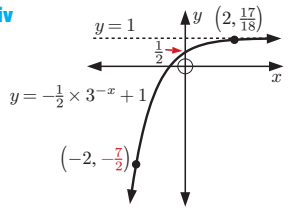
8 **h** **i** $\frac{1}{2}$

ii $y = 1$

iii When $x = 2$, $y = \frac{17}{18}$

When $x = -2$, $y = -\frac{7}{2}$

iv



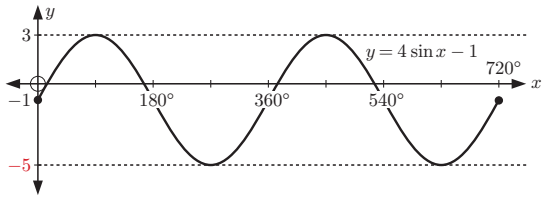
v Domain is $\{x \mid x \in \mathbb{R}\}$, Range is $\{y \mid y < 1\}$

page 474 **ANSWERS EXERCISE 9A** Question **5 a**, should read:

5 **a** $-1 \leqslant \sin\theta \leqslant 1$

page 478 **ANSWERS REVIEW SET 9B** Question **7 c**, diagram should read:

7 **c**



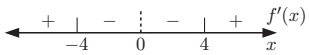
page 480 **ANSWERS EXERCISE 10G** Question **11**, should read:

11 $\dfrac{dC}{dx} = 7$ when $x = 1000$.

When 1000 toasters are being produced each week, the cost of production is increasing by £7 per toaster.

page 483 **ANSWERS REVIEW SET 11A** Question **12 a**, should include sign diagram:

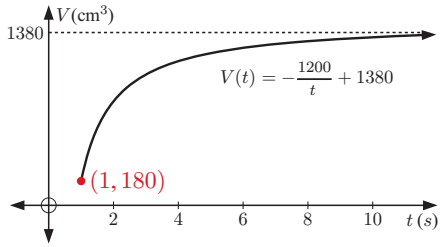
12 **a** $f'(x) = 3 - \dfrac{48}{x^2}$



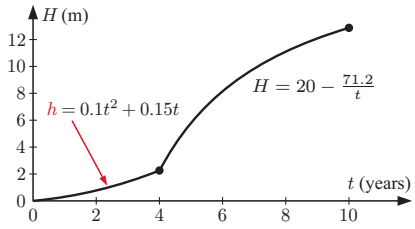
page 484 **ANSWERS EXERCISE 12A.1** Questions **7 a**, **c**, and **8 c**, diagrams should read:

7 **a** $\dfrac{1200}{t^2}$ cm^3 s^{-1} **b** **i** 300 cm^3 s^{-1} **ii** $33\frac{1}{3}$ cm^3 s^{-1}

c



8 **c**



page 484 **ANSWERS EXERCISE 12A.2** Question **3 b**, should read:

3 **a** $C(0) = \$14\,230$, which is the fixed operation cost without producing any items.

b $C'(x) = -0.000\,021\,6x^2 + 0.0122x + 18$

This is the rate at which the production cost (in dollars) is changing per item when x items are made. It gives an estimate of the cost of making the $(x + 1)$th item each day.

page 485 **ANSWERS EXERCISE 12C** Question **2 b**, should read:

2 **a** $C(x) \approx -0.178x^3 + 15.3x^2 + 3280x + 24\,500$

b $\approx$ €331 000

page 492 **ANSWERS EXERCISE 15A.1** Question **2 c**, should read:

2 **c** The times may be affected by:

- weather conditions
- walking speed
- physical fitness
- traffic.

page 502 **ANSWERS REVIEW SET 17B** Question **4 a**, should read:

4 **a** There is a cell with no corresponding site. **b** (3, 1)

The following errata were made on 16/Jun/2020

page 200 **CHAPTER 8 INVESTIGATION 2** Question **3**, should read:

3 Suppose u_0 is invested for t years at a fixed percentage rate of r per year, compounded N times per year.

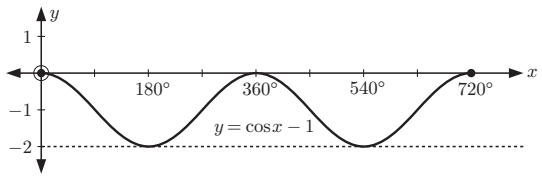
page 201 **CHAPTER 8 INVESTIGATION 2** Question **6**, should read:

6 For continuous growth, $u_n = u_0 e^{rt}$ where u_0 is the initial amount, r is the annual percentage rate, and t is the number of years.

Use this formula to find the final amount if \$1000 is invested for 1 year at a fixed rate of 6% per annum, where the interest is paid continuously. Compare this value with your calculations in **1**.

page 475 **ANSWERS EXERCISE 9D** Question **9 a**, diagram should be:

9 a



page 476 **ANSWERS EXERCISE 9D** Question **12 b**, should read:

12 **a** 4 **b** 120° **c** $\{y \mid -2 \leqslant y \leqslant 6\}$

The following errata were made on 29/Apr/2020

page 387 **SECTION 16B**, fifth step of summary should read:

SUMMARY OF STEPS FOR STUDENT'S t-TEST FOR A POPULATION MEAN

Step 1: State the **null hypothesis** H_0: $\mu = \mu_0$ and **alternative hypothesis** H_1.

Step 2: State the **significance level** α.

Step 3: Calculate the value of the **test statistic** $t = \dfrac{\overline{x} - \mu_0}{\frac{s}{\sqrt{n}}}$.

Step 4: Calculate the ***p*-value** using $T \sim t_{n-1}$ as follows:

- If H_1: $\mu > \mu_0$, p-value $= \mathrm{P}(T \geqslant t)$.
- If H_1: $\mu < \mu_0$, p-value $= \mathrm{P}(T \leqslant t)$.
- If H_1: $\mu \neq \mu_0$, p-value $= 2 \times \mathrm{P}(T \geqslant |t|)$.

Step 5: Reject H_0 if p-value $\leqslant \alpha$.

Step 6: Interpret your decision in the context of the problem. Write your conclusion in a sentence.

page 398 **SECTION 16D**, fifth step of summary should read:

SUMMARY OF THE χ^2 GOODNESS OF FIT TEST

Step 1: State the **null hypothesis** H_0 and the **alternative hypothesis** H_1.

Step 2: State the **significance level** α.

Step 3: Calculate the value of the **test statistic**: $\chi^2_{\text{calc}} = \sum \frac{(f_{\text{obs}} - f_{\text{exp}})^2}{f_{\text{exp}}}$.

Step 4: Use technology to calculate the ***p*-value**, using $\text{df} = \text{number of categories} - 1$.

Step 5: Reject H_0 if p-value $\leqslant \alpha$.

Step 6: Interpret your decision in the context of the problem. Write your conclusion in a sentence.

page 408 **SECTION 16E**, sixth step of summary should read:

SUMMARY OF THE χ^2 TEST FOR INDEPENDENCE

Step 1: State the **null hypothesis** H_0 and the **alternative hypothesis** H_1, which have the form:
H_0: the variables are independent
H_1: the variables are dependent.

Step 2: State the **significance level** α.

Step 3: Calculate $\mathbf{df} = (r-1)(c-1)$ where r and c are the number of rows and columns of the contingency table respectively.

Step 4: Construct the **expected frequency table** and calculate the value of the **test statistic**:
$\chi^2_{\text{calc}} = \sum \frac{(f_{\text{obs}} - f_{\text{exp}})^2}{f_{\text{exp}}}$.

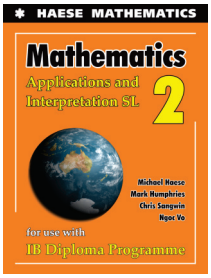
Step 5: Use technology to calculate the ***p*-value**. *or* Find the critical value χ^2_{crit} for the test.

Step 6: Reject H_0 if p-value $\leqslant \alpha$ *or* if $\chi^2_{\text{calc}} \geqslant \chi^2_{\text{crit}}$.

Step 7: Interpret your decision in the context of the problem. Write your conclusion in a sentence.

page 457 **ANSWERS EXERCISE 5E** Question **4 f**, should read:

4 **f** very strong, negative, non-linear correlation



ERRATA

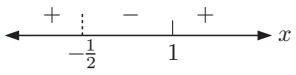
Mathematics: Applications and Interpretation SL

First edition - 2019 initial print

The following errata were made on 29/Apr/2020

page 63 **SECTION 3E Example 9**, last lines of solution should include sign diagram:

Since $(x-1)$ and $(2x+1)$ are single factors, the signs alternate.



The following errata were made on 02/Apr/2020

page 445 **ANSWERS EXERCISE 3D** Question **4** parts **c iv** and **d iv**, should read:

4 **c** **i** y-intercept 2, no x-intercepts
ii min. turning point $(0,\ 2)$ **iii** no asymptotes
iv Domain is $\{x \mid x \in \mathbb{R}\}$, Range is $\{y \mid y \geqslant 2\}$

d **i** x-intercepts -2 and 2, no y-intercept
ii no turning points **iii** no asymptotes
iv Domain is $\{x \mid x \leqslant -2$ or $x \geqslant 2\}$,
Range is $\{y \mid y \geqslant 0\}$

The following errata were made on 30/Mar/2020

page 286 **REVIEW SET 11B** Question **3 c**, should read:

3 The tangent to $y = x^3 + ax^2 - 4x + 3$ at $x = 1$ is parallel to the line $y = 3x$.

a Find a.

b Find the equation of the tangent at $x = 1$.

c Where does the tangent meet the curve again?

page 352 **CHAPTER 14 INVESTIGATION 1** Question **1**, change for simplicity:

What to do:

1 Click on the icon to access the demonstration. It shows the graph of the binomial distribution for $X \sim \text{B}(n,\ p)$. Set $n = 25$ and $p = 0.1$.

a What is the mode of X?

b Describe the shape of the distribution.

page 389 **EXERCISE 16B** Question **1**, should read:

1 A sample of size 36 is taken. The sample mean $\overline{x} = 23.75$ and the sample standard deviation $s = 3.97$. We are required to test the hypothesis H_0: $\mu = 25$ against H_1: $\mu < 25$.

a Find: **i** the test statistic **ii** the p-value.

b What decision should be made at a 5% level?

page 442 **ANSWERS EXERCISE 1C** Questions **5**, **13**, and **15**, should read:

5 **a** 1.055 km **b** 9.715 km **c** 10.05 km
For distances < 10 km, the watch is accurate to ± 0.005 km.
For distances > 10 km, the watch is accurate to ± 0.05 km.

12 1092.25 ± 34 cm^2 **13** $31.875 \text{ cm}^2 < A < 40.375 \text{ cm}^2$
14 196.5 ± 52.125 cm^3 **15** $1502.11 \text{ cm}^2 < V < 1545.69 \text{ cm}^3$

page 442 **ANSWERS EXERCISE 1D** Question **11 b ii**, should read:

11 **a** ≈ 4.40 hours (≈ 4 h 24 min 5 s)
b **i** ≈ 45.7 s **ii** $\approx 0.289\%$

page 443 **ANSWERS EXERCISE 3A** Question **7 a**, should read:

7 **a** $y^2 = x$ is a relation but not a function.
$y = x^2$ is a function (and a relation).
$y^2 = x$ has a horizontal axis of symmetry (the x-axis).
$y = x^2$ has a vertical axis of symmetry (the y-axis).
Both $y^2 = x$ and $y = x^2$ pass through $(0, 0)$ and $(1, 1)$.
$y^2 = x$ is a rotation of $y = x^2$ clockwise through $90°$ about the origin *or* $y^2 = x$ is a reflection of $y = x^2$ in the line $y = x$.

page 491 **ANSWERS EXERCISE 14F** Question **c i**, should read:

1 **c** **i** $\mu = 4.8$, $\sigma \approx 0.980$

page 493 **ANSWERS EXERCISE 15B.1** Question **10 a**, should read:

10 **a** $\mu \approx 176$ g, $\sigma \approx 24$ g **b** $\approx 81.85\%$

page 493 **ANSWERS EXERCISE 15B.2** Question **10 b**, should read:

10 **a** $\approx 84.1\%$ **b** ≈ 0.879

The following erratum was made on 22/Oct/2019

page 444 **ANSWERS EXERCISE 3C** Question **1 b**, should read:

1 **b** Domain is $\{x \mid x > 0\}$, Range is $\{y \mid y = 2, 3, 5, 7, \text{ or } 9\}$

The following errata were made on 02/Sep/2019

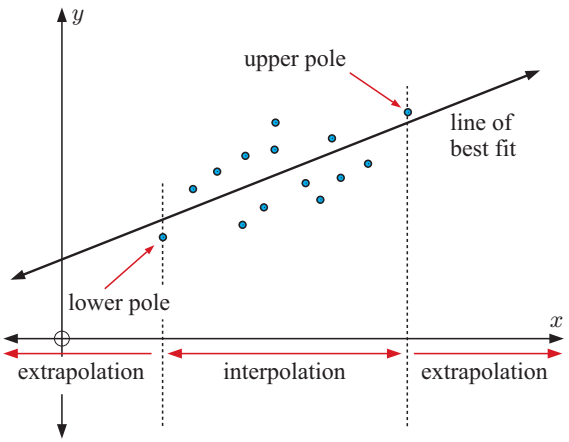
page 113 **SECTION 5C Interpolation and Extrapolation**, should read:

INTERPOLATION AND EXTRAPOLATION

Consider the data in the scatter diagram alongside. The data with the highest and lowest values are called the **poles**.

The line of best fit for the data is also drawn on the scatter diagram. We can use this line to predict the value of one variable for a given value of the other.

- If we predict a y value for an x value **in between** the poles, we say we are **interpolating** in between the poles.
- If we predict a y value for an x value **outside** the poles, we say we are **extrapolating** outside the poles.



page 114 **SECTION 5C Interpolation and Extrapolation**, first line should read:

For example, consider the line of best fit for the data in the **Opening Problem**. It can be used to predict the distance a discus will be thrown by an athlete of a particular age.

page 182 **REVIEW SET 7B** Question **12 a**, should read:

12 Abbas wanted to test the sound intensity of the speakers in the local hall. He set the output to a constant power, and took measurements at different distances. The results are given below.

Distance (d m)	1	5	10	15	20
Sound intensity (I W m^{-2})	63.7	2.55	0.637	0.283	0.159

a Abbas thinks that $I \propto \frac{1}{d}$. By calculating the value of $I \times d$ for each data point, show that he is incorrect.

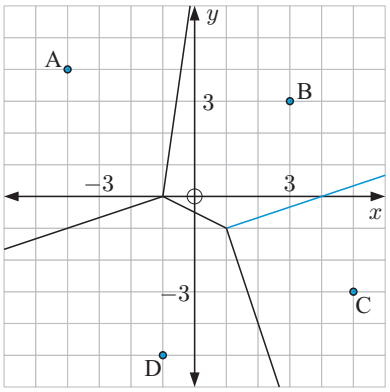
page 316 **EXERCISE 13B** Question **5 b**, should integrate with respect to x:

5 **b** For a positive function $f(x)$, $\int_2^5 f(x)\,dx = 10$, and $\int_5^9 f(x)\,dx = 12$. Find:

i $\int_5^5 f(x)\,dx$ **ii** $\int_2^9 f(x)\,dx$

page 438 **REVIEW SET 17A** Question **6 c**, should read:

6 Consider the Voronoi diagram alongside.



a Find the equation of the blue edge.

b Identify the site which is closest to:

i $(2, -1)$ **ii** $(-5, -2)$

c Redraw the Voronoi diagram with a new site added at $E(-3, -6)$.

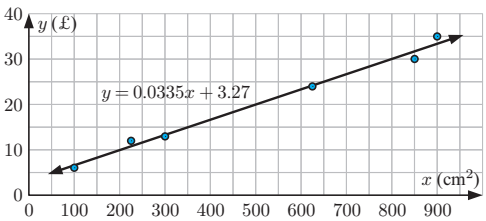
d Does the addition of site E affect your answers to **b**?

page 443 **ANSWERS REVIEW SET 1B** Question **6 b**, should read:

6 **a** $14.85 \text{ s} < t < 14.95 \text{ s}$ **b** $6.66 \text{ m s}^{-1} < s < 6.77 \text{ m s}^{-1}$

page 458 **ANSWERS REVIEW SET 5B** Question **5 c**, should read:

5 **a**, **d**

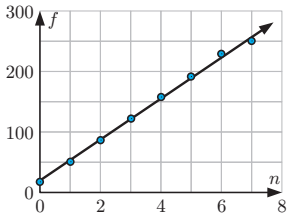


b $r \approx 0.994$ **c** There is a very strong, positive, linear correlation between *area* and *price*.

e $\approx$ £43.42, this is an extrapolation, so it may be unreliable.

page 458 **ANSWERS REVIEW SET 5B** Question **6 a**, should read:

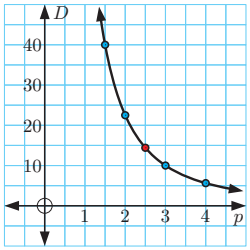
6 **a**, **d**



There is a very strong, positive, linear correlation between number of waterings and flowers produced.

page 467 **ANSWERS REVIEW SET 7A** Question **10 a**, should include point:

10 **a**



page 492 **ANSWERS REVIEW SET 14B** Questions **6 a** and **9 a**, should read:

6 **a** The probability of rolling a two is not the same for each die.
So X is not a binomial random variable.

b

x	0	1	2
$P(X = x)$	$\frac{15}{24}$	$\frac{1}{3}$	$\frac{1}{24}$

c $\frac{5}{12}$

7 $a = 0.15,\ b = 0.35$

8 **a** $E(X) = 2.1$ **b** $E(Y) = 1.9$

9 **a** The probability of spinning a 3 is the same for each spin.

page 499 **ANSWERS EXERCISE 17B** Question **11 a**, should read:

11 **a** There is a cell which does not contain a site.