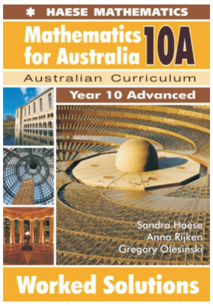


ERRATA

Mathematics for Australia 10A

Worked Solutions

2013 First Edition

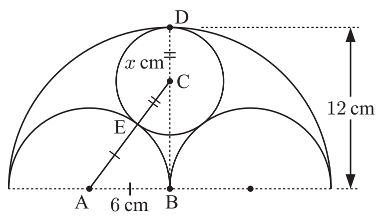
page 19 **CHAPTER 1 PRACTICE TEST 1C,** Question **1 a ii** should read:

1 **a** **i** 1 hour $= 60$ minutes
$= 60 \times 60$ seconds $\{1 \text{ minute} = 60 \text{ s}\}$
$= 3600$ seconds
and $2.998 \times 10^8 \times 3600$
$= 1.079\,28 \times 10^{12}$
$\approx 1.079 \times 10^{12}$
So, light travels about 1.079×10^{12} m in one hour (in a vacuum).

ii 1 day $= 24$ hours
$= 24 \times 3600$ seconds {using **a i**}
$= 86\,400$ seconds
and $2.998 \times 10^8 \times 86\,400$
$= 2.590\,272 \times 10^{13}$
$\approx 2.590 \times 10^{13}$
So, light travels about 2.590×10^{13} m in one day (in a vacuum).

page 145 **CHAPTER 6 EXERCISE 6E,** Question **14 a ii** should read:

14 **a** **ii** Consider the 'upper' semi-circle:



Suppose the radius of the smallest circle is x cm and CB $=$ DB $-$ DC $= (12 - x)$ cm.
We construct [AC], which passes through E.

Now, AE $= 6$ cm {from **a i**}
$\therefore$ AC $= (6 + x)$ cm
$\therefore (6+x)^2 = 6^2 + (12-x)^2$ {Pythagoras in $\triangle$ABC}
$\therefore \cancel{36} + 12x + \cancel{x^2} = \cancel{36} + 144 - 24x + \cancel{x^2}$
$\therefore 12x = 144 - 24x$
$\therefore 36x = 144$
$\therefore x = 4$
$\therefore$ the radius of the smallest circles is 4 cm.

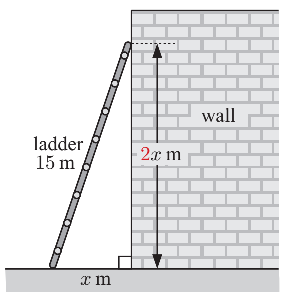
page 147 **CHAPTER 6 EXERCISE 6F,** Questions **10** and **11** should begin with measures in metres:

10 Let the diagonal [BD] be $2x$ m.

11 Consider the pyramid on top of the tower. Let the diagonal [AC] be $2x$ m.

page 153 **CHAPTER 6 PRACTICE TEST 6B,** Question **7** should have correctly labelled diagram:

7 Suppose the foot of the ladder is x m from the wall.
$\therefore$ the ladder reaches $2x$ m up the wall.
$\therefore x^2 + (2x)^2 = 15^2$ {Pythagoras}
$\therefore x^2 + 4x^2 = 225$
$\therefore 5x^2 = 225$
$\therefore x^2 = 45$
$\therefore x = \sqrt{45}$ {as $x > 0$}
$\therefore 2x = 2\sqrt{45}$
$\therefore 2x \approx 13.42$ m
The ladder reaches about 13.4 m up the wall.



page 189 **CHAPTER 8 Exercise 8B,** Question **1 b** should read:

1 **a** $C = 2\pi r$ where $r = 4.2$

$\therefore$ $C = 2 \times \pi \times 4.2$

≈ 26.4

$\therefore$ the circumference is approximately 26.4 cm.

b $C = 2\pi r$ where $C = 112$

$\therefore$ $112 = 2\pi r$

$\therefore$ $r = \frac{112}{2\pi}$

≈ 17.8

$\therefore$ the radius is approximately 17.8 cm.

page 256 **CHAPTER 10 EXERCISE 10E,** Question **2 h** should not magically alter a term:

2 **g** $x^2 + 1 = 3x$

$\therefore$ $x^2 - 3x + 1 = 0$ which has $a = 1,\ b = -3,\ c = 1$

$\therefore$ $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(1)}}{2(1)}$

$\therefore$ $x = \frac{3 \pm \sqrt{9 - 4}}{2}$

$\therefore$ $x = \frac{3 \pm \sqrt{5}}{2}$

h $2x^2 = 2x - 3$

$\therefore$ $2x^2 - 2x + 3 = 0$ which has $a = 2,\ b = -2,\ c = 3$

$\therefore$ $x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(2)(3)}}{2(2)}$

$\therefore$ $x = \frac{2 \pm \sqrt{4 - 24}}{4}$

$\therefore$ $x = \frac{2 \pm \sqrt{-20}}{4}$

but $-20 < 0$

$\therefore$ no real solutions exist.

page 275 **CHAPTER 11 EXERCISE 11A,** Question **2 e** should subtract a negative number correctly:

2 **d** $\text{AB} = \sqrt{(-\sqrt{2} - \sqrt{2})^2 + (0 - 0)^2}$

$= \sqrt{(-2\sqrt{2})^2 + 0^2}$

$= \sqrt{8}$ units

$\text{AC} = \sqrt{(0 - \sqrt{2})^2 + (-\sqrt{5} - 0)^2}$

$= \sqrt{(-\sqrt{2})^2 + (-\sqrt{5})^2}$

$= \sqrt{2 + 5}$

$= \sqrt{7}$ units

$\text{BC} = \sqrt{(0 - -\sqrt{2})^2 + (-\sqrt{5} - 0)^2}$

$= \sqrt{(\sqrt{2})^2 + (-\sqrt{5})^2}$

$= \sqrt{2 + 5}$

$= \sqrt{7}$ units

Since AC = BC, triangle ABC is isosceles.

e $\text{AB} = \sqrt{(-\sqrt{3} - \sqrt{3})^2 + (1 - 1)^2}$

$= \sqrt{(-2\sqrt{3})^2 + 0^2}$

$= \sqrt{12}$ units

$\text{AC} = \sqrt{(0 - \sqrt{3})^2 + (-2 - 1)^2}$

$= \sqrt{(-\sqrt{3})^2 + (-3)^2}$

$= \sqrt{3 + 9}$

$= \sqrt{12}$ units

$\text{BC} = \sqrt{(0 - -\sqrt{3})^2 + (-2 - 1)^2}$

$= \sqrt{(\sqrt{3})^2 + (-3)^2}$

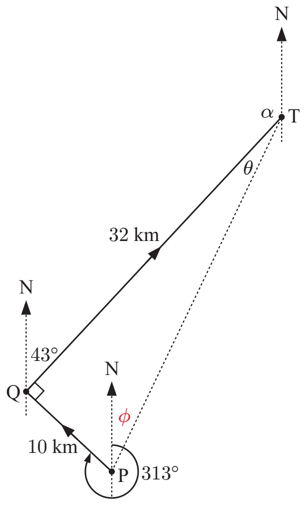
$= \sqrt{3 + 9}$

$= \sqrt{12}$ units

Since AB = AC = BC, triangle ABC is equilateral.

page 327 **CHAPTER 12 EXERCISE 12F,** Question **12** should work out the bearing in part **a**:

12



$\widehat{\text{NPQ}} = 360° - 313° = 47°$ {angles at a point}

$\widehat{\text{TQP}} = 180° - 43° - 47°$ {cointerior angles}

$= 90°$

a $\text{TP}^2 = 10^2 + 32^2$ {Pythagoras}

$\therefore$ $\text{TP} = \sqrt{10^2 + 32^2}$ {as TP > 0}

$\therefore$ $\text{TP} \approx 33.5$

$\tan\theta = \frac{10}{32}$ $\{\tan\theta = \frac{\text{OPP}}{\text{ADJ}}\}$

$\therefore$ $\theta = \tan^{-1}\left(\frac{10}{32}\right)$

$\therefore$ $\theta \approx 17.4°$

$\alpha = 180° - 43° = 137°$ {cointerior angles}

$\phi = 180° - \alpha - \theta$ {cointerior angles}

$\approx 180° - 137° - 17.4°$

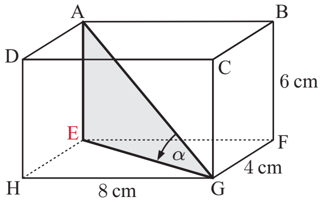
$\approx 25.6°$

So, the trawler is about 33.5 km from P, on a bearing of $\approx 025.6°$.

b The trawler must sail on a bearing of $360° - 137° - 17.4° \approx 206°$.

page 331 **CHAPTER 12 REVIEW SET 12,** Question **10 b** should have vertex E labelled:

10 b



$(\text{EG})^2 = 4^2 + 8^2$ {Pythagoras}

$\therefore \ \text{EG} = \sqrt{80}$

$\tan\alpha = \frac{6}{\sqrt{80}}$ $\{\tan\alpha = \frac{\text{OPP}}{\text{ADJ}}\}$

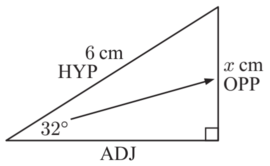
$\therefore \ \alpha = \tan^{-1}(\frac{6}{\sqrt{80}})$

$\therefore \ \alpha \approx 33.9°$

$\therefore \ \text{A}\widehat{\text{G}}\text{E} \approx 33.9°$

page 334 **CHAPTER 12 PRACTICE TEST 12B,** Question **3 a** should not give the answer in degrees:

3 a



$\sin 32° = \frac{x}{6}$ $\{\sin\theta = \frac{\text{OPP}}{\text{HYP}}\}$

$\therefore \ 6 \times \sin 32° = x$ {multiplying both sides by 6}

$\therefore \ x \approx 3.18$ {calculator}

page 348 **CHAPTER 13 EXERCISE 13D,** Question **4 a** should read:

4 a

Distance d (m)	*Frequency*	*Interval midpoint*	*Product*
$20 \leqslant d < 30$	2	25	50
$30 \leqslant d < 40$	6	35	210
$40 \leqslant d < 50$	26	45	1170
$50 \leqslant d < 60$	12	55	660
$60 \leqslant d < 70$	3	65	195
$70 \leqslant d < 80$	1	75	75
Total	50		2360

$\therefore$ mean

$= \frac{\text{sum of data values}}{\text{the number of data values}}$

$\approx \frac{2360}{50}$

≈ 47.2 m

page 401 **CHAPTER 15 PRACTICE TEST 15C,** Question **2 a** should read:

2 a $\frac{\text{BC}}{\sin 60°} = \frac{12}{\sin 40°}$ {sine rule}

$\therefore \ \text{BC} = \frac{12 \times \sin 60°}{\sin 40°}$

$\therefore \ \text{BC} \approx 16.168$ m

$\therefore \ \text{BC} \approx 16.2$ m

$\text{DC} = \text{BC} - \text{BD}$

$\approx 16.2 - 6$

$\therefore \ \text{DC} \approx 10.2$ m

b Area $= \frac{1}{2}ab\sin C$

$\therefore \ 13.5 = \frac{1}{2} \times 6 \times \text{BE} \times \sin 40°$

$\therefore \ \text{BE} = \frac{9}{2 \times \sin 40°}$

$\therefore \ \text{BE} \approx 7.00$ m

page 439 **CHAPTER 17 EXERCISE 17B.1,** Question **10 c** last 3 lines should read:

10 c $0.442 > 0.438 > 0.120$

$\therefore$ Carina is now most likely to win at 44.2%, followed by Pia at 43.8%, and now Larry is least likely to win at only 12.0%.

page 468 **CHAPTER 18 EXERCISE 18D.1,** Question **4 a** should read:

4 a The graph of $y = g(x)$ is obtained by translating $f(x) = -\frac{1}{2}x - 1$ 4 units upwards.

$\therefore \ g(x) = f(x) + 4$

$= -\frac{1}{2}x - 1 + 4$

$= -\frac{1}{2}x + 3$

b The graph of $y = g(x)$ is obtained by translating $f(x) = \frac{3}{2}x + 1$ 2 units to the right.

$\therefore \ g(x) = \frac{3}{2}(x - 2) + 1$

$= \frac{3}{2}x - 3 + 1$

$= \frac{3}{2}x - 2$

page 518 **CHAPTER 20 EXERCISE 20E.2,** Question **7 a iii** should read:

7 **a** **iii** $\log 250 \approx 2.397\,940\,009$
≈ 2.398

iv $\log(\frac{1}{250}) \approx -2.397\,940\,009$
≈ -2.398

page 527 **CHAPTER 20 PRACTICE TEST 20C,** Question **4 c** should be printed:

4 **c** When $N = 200$, $200 = 10 \times 1.3^t$

$$\therefore \quad 1.3^t = 20$$

$$\therefore \quad \log(1.3^t) = \log 20 \qquad \{\text{taking the } \log \text{ of both sides}\}$$

$$\therefore \quad t \log 1.3 = \log 20 \qquad \{\log(a^n) = n \log a\}$$

$$\therefore \quad t = \frac{\log 20}{\log 1.3}$$

$$\therefore \quad t \approx 11.4$$

It will take about 11.4 weeks for Danielle's blog to have 200 followers.