

VCE VM Numeracy Units 3 & 4

Chapter 14 — GAT Section A numeracy practice

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Chapter 14 GAT Section A numeracy practice — 14A GAT Section A numeracy practice 1

About this practice set — what the GAT is. The General Achievement Test (GAT) is a statewide test sat by VCE students. Its Section A holds one writing task in two parts, and 100 multiple-choice questions: 50 numeracy questions and 50 textual (reading) questions. Students enrolled in the VCE Vocational Major sit Section A only when they are not enrolled in any VCE or scored VCE VET Unit 3–4 sequence. This set practises the **numeracy** multiple-choice half — 50 original GAT-style questions that draw on the Unit 3 and Unit 4 areas of study, in everyday contexts. The writing task and the textual questions are practised in VM Literacy, not here. Practice set 2 (14B) gives a second full set; the answers and fully-worked solutions for both sets are at the back of this chapter.

Materials: pen, paper; a scientific calculator may be used. 50 multiple-choice questions (50 marks). Suggested time: about 75 minutes — roughly one and a half minutes per question, so if a question is taking much longer, mark it, guess, and come back at the end.

About the data in this practice set. The prices, times and other numbers here are **made up** (not real): pretend people, pretend businesses and pretend numbers, built for this book so you can practise the maths. Nothing here is real data about a real business, person or place.

Choose the response that is correct for the question.

Questions 1–3

The table shows the prices at the Wattle Hill Farmers Market stall run by Anh's family.

Item	Price
Jar of honey	\$8.50
Jar of jam	\$6.20
Candle	\$12.40

Question 1

Anh buys 4 jars of honey and 3 candles from the stall. The total cost is

- A. \$71.20
- B. \$46.40
- C. \$75.10
- D. \$89.80

Question 2

On Saturday the stall takes \$860 in total. The stall pays 15% of its takings to the market committee. The amount paid to the committee is

- A. \$86.00
- B. \$129.00
- C. \$731.00
- D. \$989.00

Question 3

A customer buys 4 jars of honey and 3 candles. Of the following, the closest estimate of the total cost is

- A. \$35
- B. \$70
- C. \$105
- D. \$700

Questions 4–5

The temperatures at Frost Hollow at 6 am on five days one week were:

Monday -2°C , Tuesday -5°C , Wednesday 3°C , Thursday 1°C , Friday -7°C

Question 4

The five days, listed from the coldest morning to the warmest morning, are

- A. Friday, Tuesday, Monday, Thursday, Wednesday
- B. Wednesday, Thursday, Monday, Tuesday, Friday
- C. Thursday, Monday, Wednesday, Tuesday, Friday
- D. Monday, Tuesday, Wednesday, Thursday, Friday

Question 5

The Wednesday morning was warmer than the Friday morning by

- A. 10°C
- B. 4°C
- C. -4°C
- D. -10°C

Questions 6–7

The Eastside Community Garden group is planning a new square vegetable bed.

Question 6

The bed will have an area of 144 m^2 . The length of each side of the bed is

- A. 14.4 m
- B. 36 m
- C. 72 m
- D. 12 m

Question 7

The group spends \$ 840 for the year, shared between tools and plants in the ratio 2:5. The amount spent on tools is

- A. \$ 240
- B. \$ 336
- C. \$ 420
- D. \$ 600

Questions 8–10

The Hilltop Bakery sells loaves of sourdough bread.

Question 8

In the first hour, $\frac{3}{8}$ of the loaves baked are sold. Written as a percentage, $\frac{3}{8}$ is

- A. 0.375 %
- B. 3.75 %
- C. 38 %
- D. 37.5 %

Question 9

A loaf costs \$ 3.20. The bakery raises the price by 15 %. The new price of a loaf is

- A. \$ 2.72
- B. \$ 3.35
- C. \$ 3.52
- D. \$ 3.68

Question 10

The bread oven is set to 180 °C. A recipe card from overseas gives temperatures in degrees Fahrenheit, using °F = $1.8 \times \text{°C} + 32$. The oven temperature in degrees Fahrenheit is

- A. 212 °F
- B. 324 °F
- C. 356 °F
- D. 381.6 °F

Questions 11–12

Question 11

A logo is shaped like a regular hexagon (six equal sides, six equal angles). The number of lines of symmetry of a regular hexagon is

- A. 2
- B. 3
- C. 6
- D. 12

Question 12

A sign is shaped like an isosceles triangle. The angle at the top vertex is 40° . Each of the two equal base angles is

- A. 35°
- B. 50°
- C. 70°
- D. 140°

Questions 13–15

A photo that is 10 cm wide is enlarged to a poster that is 25 cm wide. A scale model of a real object is built at a scale of 1:18.

Question 13

The scale factor of the enlargement from photo to poster is

- A. 2.5
- B. 0.4
- C. 15
- D. 35

Question 14

The area of the photo is 40 cm^2 . The area of the poster is

- A. 100 cm^2
- B. 625 cm^2
- C. 40 cm^2
- D. 250 cm^2

Question 15

A part of the real object is 4.32 m long. The length of this part on the 1 : 18 scale model is

- A. 2.4 cm
- B. 24 cm
- C. 240 cm
- D. 7 776 cm

Questions 16–17

Question 16

Wes's farm stores grain in a silo with a flat circular base, a curved side wall of the same width all the way up, and a flat circular top. The shape of the silo is a

- A. cone
- B. cylinder
- C. sphere
- D. rectangular prism

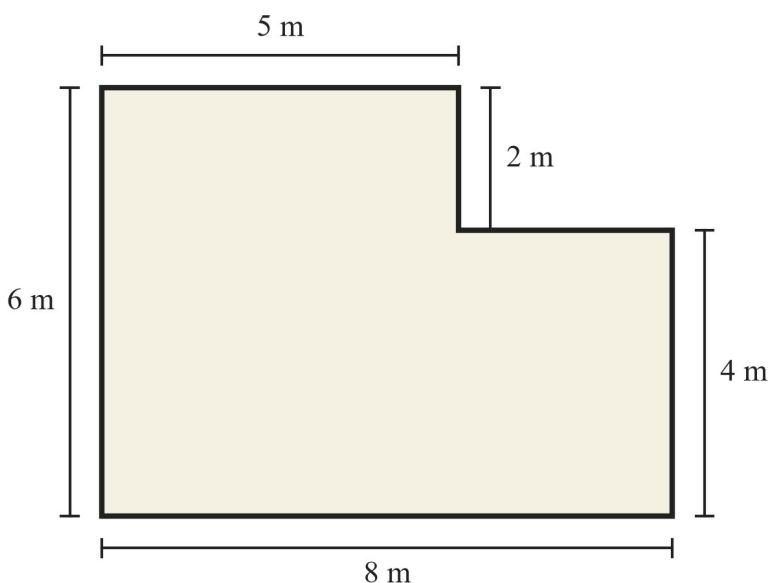
Question 17

The shed roof is shaped like a square-based pyramid. The total number of edges on a square-based pyramid is

- A. 4
- B. 5
- C. 8
- D. 12

Questions 18–21

The floor plan shows a room in which every angle is a right angle. The labelled side lengths are in metres.



Question 18

The area of the floor of the room is

- A. 42 m^2
- B. 45 m^2
- C. 48 m^2
- D. 54 m^2

Question 19

The perimeter of the floor of the room is

- A. 22 m
- B. 23 m
- C. 28 m
- D. 42 m

Question 20

Carpet for the whole floor costs \$ 45 per square metre, with no waste. The cost of the carpet is

- A. \$ 1 260
- B. \$ 2 160
- C. \$ 2 430
- D. \$ 1 890

Question 21

The ceiling is 2.6 m above the floor. The volume of air in the room is

- A. 72.8 m^3
- B. 104 m^3
- C. 109.2 m^3
- D. 124.8 m^3

Questions 22–24

Wes fills a cylindrical water tank on the farm. The tank has a radius of 0.6 m and a height of 1.5 m. Use $1 \text{ m}^3 = 1\,000 \text{ L}$.

Question 22

The capacity of the full tank, to the nearest litre, is

- A. 848 L
- B. 1 696 L
- C. 2 827 L
- D. 6 786 L

Question 23

A pump fills the empty tank at 15 L per minute. The time to fill the tank, to the nearest minute, is

- A. 57 minutes
- B. 1 hour 13 minutes
- C. 1 hour 53 minutes
- D. 3 hours 8 minutes

Question 24

The farm uses 120 L from the full tank each day. The number of **full** days the full tank can supply the farm is

- A. 14 days
- B. 14.1 days
- C. 15 days
- D. 141 days

Questions 25–28

Nate works at the Copper Kettle Café. His roster is written in 24-hour time.

Question 25

Nate's Saturday shift starts at 14:00. In 12-hour time, this is

- A. 2:00 am
- B. 2:00 pm
- C. 4:00 pm
- D. 14:00 pm

Question 26

On Friday, Nate's shift runs from 22:00 one day to 06:30 the next morning, with no breaks. The length of the shift is

- A. 6 hours 30 minutes
- B. 9 hours 30 minutes
- C. 15 hours 30 minutes
- D. 8 hours 30 minutes

Question 27

Nate is paid \$ 28.40 per hour. For a shift of 8.5 hours, Nate is paid

- A. \$ 227.20
- B. \$ 241.04
- C. \$ 241.40
- D. \$ 482.80

Question 28

The café's head office is in Perth. Melbourne time is UTC + 10 and Perth time is UTC + 8 (standard time, no daylight saving). When it is 15:30 in Melbourne, the time in Perth is

- A. 13:00
- B. 13:30
- C. 15:30
- D. 17:30

Questions 29–31

Marta drives 320 km from her home to the coast. Her car uses 8.5 L of fuel per 100 km, and fuel costs \$ 1.82 per litre.

Question 29

The fuel used for the trip is

- A. 2.72 L
- B. 272 L
- C. 37.6 L
- D. 27.2 L

Question 30

The cost of the fuel for the trip, to the nearest cent, is

- A. \$ 49.50
- B. \$ 49.51
- C. \$ 68.52
- D. \$ 495.04

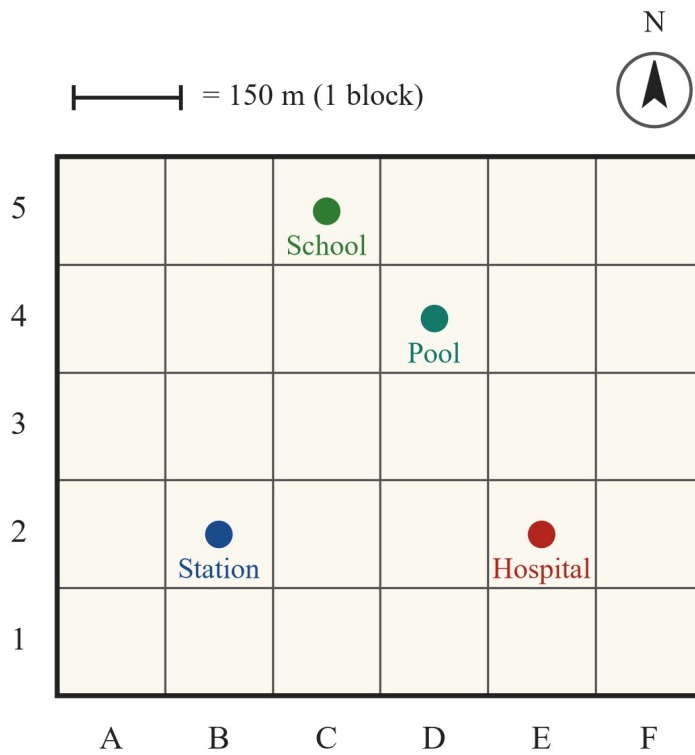
Question 31

Marta's paper map has a scale of 1 : 25 000. A straight section of the trip measures 8 cm on the map. The real length of this section is

- A. 200 m
- B. 2 km
- C. 20 km
- D. 200 km

Questions 32–34

The map shows part of the town of Gumtree Flat. Each square is one block, and one block is 150 m. A position is written as (column letter)(row number), so the hospital is at E2.



Question 32

The grid reference of the pool is

- A. D4
- B. 4D
- C. D3
- D. C4

Question 33

The pool is directly north-east, north-west, south-east or south-west of the station. The direction of the pool from the station is

- A. north-west
- B. south-east
- C. south-west
- D. north-east

Question 34

A student walks from the school to the station along the grid streets, by the shortest route. The distance walked is

- A. 150 m
- B. 450 m
- C. 600 m
- D. 750 m

Question 35

Two straight paths cross in a park. One of the four angles formed is 52° . The angle vertically opposite to it is

- A. 38°
- B. 52°
- C. 104°
- D. 128°

Questions 36–39

Kiri plays netball. Her goals in eight games, in the order the games were played, were:

15, 12, 46, 14, 13, 15, 14, 13

Question 36

The median number of goals is

- A. 13.5
- B. 14
- C. 15
- D. 17.75

Question 37

The mean number of goals per game, correct to 1 decimal place, is

- A. 14.0
- B. 17.8
- C. 17.7
- D. 17.75

Question 38

Using the gap test on the sorted data, the outlier in Kiri's goals is

- A. 12
- B. 15
- C. 46
- D. There is no outlier.

Question 39

Which statement best describes the measure that summarises Kiri's typical number of goals?

- A. The mean, because it uses every data value.
- B. The median, because the outlier 46 pulls the mean up.
- C. The mean, because the mean is always the best measure of centre.
- D. The median, because the median is always smaller than the mean.

Questions 40–42

A sports club asks its 60 members to name their favourite sport to watch. The results were: soccer 24, basketball 15, swimming 12, tennis 9.

Question 40

The variable ‘favourite sport to watch’ is

- A. categorical
- B. numerical discrete
- C. numerical continuous
- D. not a variable at all

Question 41

The club draws a sector graph of the results. The sector angle for soccer is

- A. 24°
- B. 40°
- C. 86.4°
- D. 144°

Question 42

The percentage of members who chose swimming is

- A. 5 %
- B. 12 %
- C. 20 %
- D. 25 %

Questions 43–45

A school fete runs a raffle with 40 tickets, and 5 tickets will each win a prize. Marta buys 1 ticket.

Question 43

The probability that Marta’s ticket wins a prize, as a fraction in simplest form, is

- A. $\frac{1}{8}$
- B. $\frac{1}{5}$
- C. $\frac{1}{40}$
- D. $\frac{7}{8}$

Question 44

Written as a percentage, the probability that Marta's ticket wins a prize is

- A. 1.25 %
- B. 12.5 %
- C. 8 %
- D. 12 %

Question 45

Next year the fete sells 240 tickets and keeps the same fraction of winning tickets. The expected number of winning tickets is

- A. 5
- B. 24
- C. 30
- D. 48

Question 46

A fair coin is tossed and a fair six-sided die is rolled. The probability of a head **and** a 4 is

- A. $\frac{1}{12}$
- B. $\frac{1}{7}$
- C. $\frac{1}{6}$
- D. $\frac{1}{2}$

Question 47

A workplace hazard is scored likelihood 4 and consequence 3. The risk score is likelihood $\times$ consequence, and the zones are: low 1–4, medium 5–9, high 10–14, extreme 15–25. The hazard's risk score and zone are

- A. score 7, medium risk
- B. score 12, medium risk
- C. score 12, high risk
- D. score 12, extreme risk

Questions 48–49

Wes's workshop spreadsheet calculates job costs. Column B holds the hours worked, column C holds the hourly rate in dollars, and column D holds the cost of each job, with D2 holding the formula $=B2 * C2$.

	A	B	C	D
1	Job	Hours	Rate	Cost
2	Job 1	6.5	48	
3	Job 2	4.5	40	
4	Job 3	5.5	41	
5	Job 4	3	32	
6	Total			=SUM(D2:D5))

Question 48

The value shown in cell D2 is

- A. \$ 288.00
- B. \$ 54.50
- C. \$ 3 120.00
- D. \$ 312.00

Question 49

The value shown in cell D6 is

- A. \$ 408.00
- B. \$ 203.38
- C. 4
- D. \$ 813.50

Question 50

A print shop offers two plans. Plan A costs \$ 15 plus \$ 0.60 per page. Plan B costs \$ 45 plus \$ 0.30 per page. The number of pages for which the two plans cost exactly the same is

- A. 50 pages
- B. 60 pages
- C. 100 pages
- D. 150 pages

End of Practice Set 1

Chapter 14 GAT Section A numeracy practice — 14B GAT Section A numeracy practice 2

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Questions 1–4

The Tallow Lane milk bar is run by Delia. The prices below are from her counter.

Question 1

Delia stocks the same orange juice in two sizes: a 600 mL carton for \$4.08, and a 1 L carton for \$6.60. The cost per 100 mL of the 1 L carton is

- A. \$0.66
- B. \$0.68
- C. \$6.60
- D. \$0.07

Question 2

A school group pays \$52.80 for milkshakes at the counter. The price includes 10% GST. The amount of GST included in the \$52.80 is

- A. \$5.28
- B. \$4.80
- C. \$5.81
- D. \$48.00

Question 3

The price of a flat white at the milk bar rises from \$4.00 to \$5.00. The percentage increase in the price is

- A. 20%
- B. 80%
- C. 125%
- D. 25%

Question 4

Cans of lemonade cost \$2.15 each, or an 8-pack of the same cans costs \$14.00. The amount saved by buying one 8-pack instead of 8 single cans is

- A. \$3.20
- B. \$14.00
- C. \$17.20
- D. \$0.40

Questions 5–9

The Bramley Street Depot is a small courier business. Questions 5 to 9 use its pay rates, timesheet and roster.

Question 5

Bruno is paid \$34.80 an hour for the first 38 hours in a week. Hours after 38 are paid at time-and-a-half. In one week Bruno works 44 hours. His pay for that week is

- A. \$1531.20
- B. \$1635.60
- C. \$313.20
- D. \$1322.40

Question 6

Sonia uses her own car for deliveries. The depot pays her 80 cents for each kilometre she drives for work. In one week she drives 135 km for the depot. The allowance Sonia is paid for that week is

- A. \$10.80
- B. \$168.75
- C. \$108.00
- D. \$1080.00

Question 7

A timesheet records one of Otis's shifts as 8.2 hours. Written in hours and minutes, 8.2 hours is

- A. 8 hours 20 minutes
- B. 8 hours 2 minutes
- C. 8 hours 30 minutes
- D. 8 hours 12 minutes

Question 8

The depot roster runs in a repeating cycle: 4 days on, then 2 days off. Otis starts the cycle on a day on. Over the next 30 days, the number of days on that Otis works is

- A. 20
- B. 24
- C. 15
- D. 10

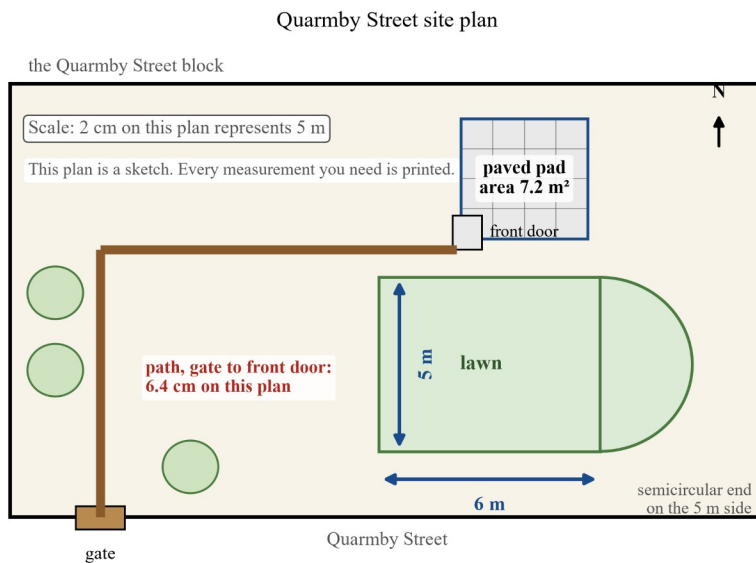
Question 9

Each week the depot records the change in the number of parcels delivered, compared with the week before. Over five weeks the changes were -3 , 2 , -5 , 4 and -1 parcels. The mean weekly change over the five weeks is

- A. 0.6
- B. -3
- C. 3
- D. -0.6

Questions 10–14

Hector is landscaping the Quarmbly Street block shown in the plan. The paved pad is a square. Every measurement needed is printed on the plan.



Question 10

The paved pad has an area of 7.2 m^2 . Each paver covers 0.06 m^2 . The number of pavers needed to cover the whole pad is

- A. 12
- B. 120
- C. 1200
- D. 43.2

Question 11

The sand laid under the pavers is delivered as 1.8 t, packed into 20 kg bags. The number of bags delivered is

- A. 90
- B. 9
- C. 180
- D. 36 000

Question 12

On the plan, the path from the gate to the front door measures 6.4 cm. Using the scale statement printed on the plan, the real length of the path is

- A. 32 m
- B. 2.56 m
- C. 16 m
- D. 160 m

Question 13

The lawn is a 6 m by 5 m rectangle with a semicircular end on one of the 5 m sides. The total area of the lawn, to the nearest square metre, is

- A. 30 m²
- B. 50 m²
- C. 69 m²
- D. 40 m²

Question 14

Using your answer to Question 13 for the lawn's area, topsoil is spread over the whole lawn to a depth of 0.15 m. Topsoil costs \$86 per m³. The cost of the topsoil for the lawn, to the nearest cent, is

- A. \$3 440.00
- B. \$5 160.00
- C. \$516.00
- D. \$51.60

Questions 15–18

Nerida is planning a coach trip from her town to Lantern Bay.

Question 15

The coach leaves at 23:40 and arrives at 06:55 the next morning. The journey includes one rest stop of 50 minutes. The time the coach spends travelling, not counting the rest stop, is

- A. 7 hours 15 minutes
- B. 8 hours 5 minutes
- C. 5 hours 35 minutes
- D. 6 hours 25 minutes

Question 16

From Lantern Bay, Nerida rings her cousin. Nerida's clock runs on UTC+10 and shows 09:45 on Monday at the moment of the call. Her cousin's clock runs on UTC-10. The local time and day where her cousin is, at that same moment, is

- A. 23:45 Sunday
- B. 13:45 Sunday
- C. 05:45 Tuesday
- D. 13:45 Monday

Question 17

On the way home the coach travels 342 km in 4 hours 50 minutes. Its average speed, to 1 decimal place, is

- A. 85.5 km/h
- B. 76.0 km/h
- C. 70.7 km/h
- D. 70.8 km/h

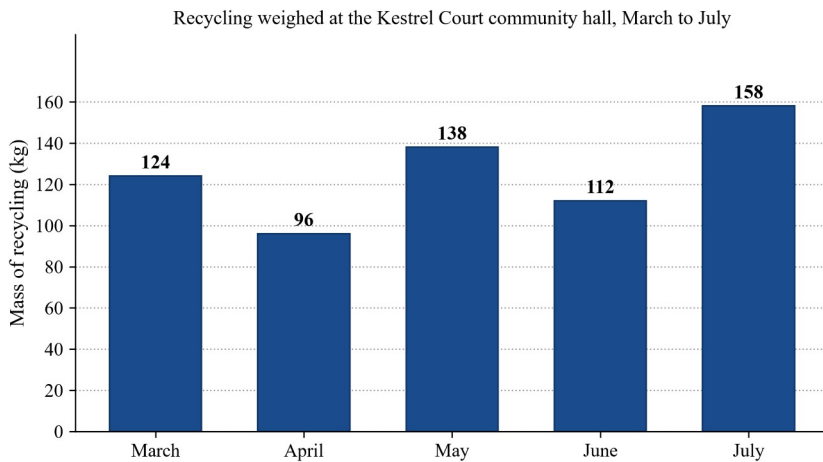
Question 18

In Lantern Bay a taxi charges \$ 4.60 for the first 5 km of a trip, then \$ 1.35 for each extra kilometre. The fare for a 22 km trip is

- A. \$ 29.70
- B. \$ 34.30
- C. \$ 5.95
- D. \$ 27.55

Questions 19–22

The column graph shows the mass of recycling weighed at the Kestrel Court community hall in each of five months.



Question 19

The total mass of recycling weighed over the five months is

- A. 628 kg
- B. 618 kg
- C. 158 kg
- D. 638 kg

Question 20

The month with the greatest increase on the month before it is

- A. May
- B. July
- C. June
- D. March

Question 21

The median of the five masses is

- A. 138 kg
- B. 125.6 kg
- C. 124 kg
- D. 96 kg

Question 22

The range of the five masses is

- A. 254 kg
- B. 62 kg
- C. 158 kg
- D. 96 kg

Question 23

A council surveys 250 residents about volunteering. Of the 160 residents aged under 30, 104 volunteer. Of the 90 residents aged 30 and over, 54 volunteer. The percentage of the residents aged under 30 who volunteer, to the nearest whole per cent, is

- A. 42 %
- B. 60 %
- C. 63 %
- D. 65 %

Questions 24–28

Questions 24 to 28 are about numbers in health settings.

Question 24

A child weighs 24 kg. A medicine is dosed at 25 mg per kg of body weight, and the liquid suspension contains 60 mg of the medicine in each mL. The volume of suspension to give, to the nearest whole mL, is

- A. 24 mL
- B. 600 mL
- C. 10 mL
- D. 0.4 mL

Question 25

Milo is 32 years old. A training guide gives a maximum heart rate of 220 minus age, in beats per minute, and says to train at 60 % of that maximum. Milo's training heart rate, to the nearest whole beat per minute, is

- A. 188
- B. 132
- C. 113
- D. 112

Question 26

A packet states 1 580 kJ of energy in each 400 g portion. Colin eats 250 g of the food. The energy he takes in, to the nearest whole kJ, is

- A. 988 kJ
- B. 1 330 kJ
- C. 2 528 kJ
- D. 987 kJ

Question 27

A bag of potatoes is labelled 187 pounds. Using $1 \text{ kg} = 2.205 \text{ pounds}$, the mass of the bag in kilograms, to 1 decimal place, is

- A. 84.8 kg
- B. 85.0 kg
- C. 412.3 kg
- D. 8.5 kg

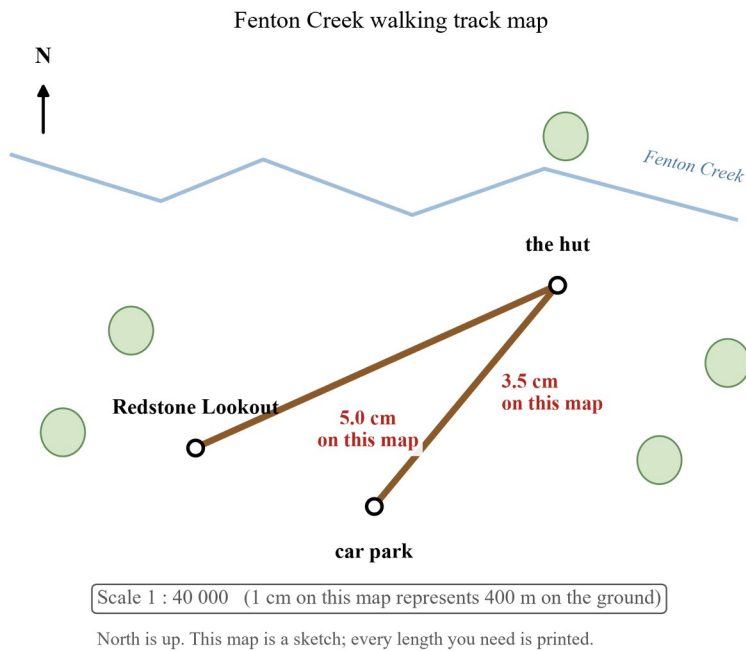
Question 28

A thermometer reads 99.5°F . Using the rule “subtract 32, then divide by 1.8”, the temperature in degrees Celsius, to 1 decimal place, is

- A. 55.3°C
- B. 37.5°C
- C. 67.5°C
- D. 73.1°C

Questions 29–31

The map shows a walking track from the car park to the hut, and on from the hut to Redstone Lookout.



Question 29

On the map, the track from the car park to the hut measures 3.5 cm. The real distance from the car park to the hut is

- A. 14 000 m
- B. 140 000 m
- C. 400 m
- D. 1 400 m

Question 30

The leg of the track from the hut to Redstone Lookout has a bearing of 247.5° . On a 16-point compass, that bearing is named

- A. west-north-west
- B. south-west
- C. west-south-west
- D. south-south-west

Question 31

On the map, the leg from the hut to Redstone Lookout measures 5.0 cm. Walking that leg at 5 km/h, the time it takes is

- A. 12 min
- B. 24 min
- C. 60 min
- D. 10 min

Questions 32–34

Question 32

At 2:20 on an analogue clock, the smaller angle between the hour hand and the minute hand is

- A. 60°
- B. 50°
- C. 120°
- D. 130°

Question 33

One interior angle of a regular pentagon is

- A. 120°
- B. 135°
- C. 540°
- D. 108°

Question 34

A stockfeed mix uses oats, barley and lupins in the ratio 3:5:2. One batch of the mix uses 60 kg of oats. The mass of lupins in the same batch is

- A. 40 kg
- B. 100 kg
- C. 200 kg
- D. 24 kg

Questions 35–38

Question 35

A machine repair costs a \$60 call-out fee plus \$25 for each hour of work. A farm sets a budget of \$200 for the repair, fee included. The greatest whole number of hours of work the budget allows is

- A. 8 hours
- B. 6 hours
- C. 5 hours
- D. 4 hours

Question 36

A credit union pays simple interest of 4.5 % per year on a term deposit. Wendy deposits \$ 6 200 for 4 years. The interest earned over the 4 years is

- A. \$ 279.00
- B. \$ 7 316.00
- C. \$ 111.60
- D. \$ 1 116.00

Question 37

A washing machine has a cash price of \$ 1 580. On terms it is a \$ 250 deposit plus 24 monthly payments of \$ 68. The extra amount paid by buying on terms instead of for cash is

- A. \$ 302.00
- B. \$ 1 882.00
- C. \$ 1 632.00
- D. \$ 552.00

Question 38

A market garden's income in one month is \$ 2 400. The next month it rises by 5 %, and the month after that it falls by 5 %. The income in the month after the fall is

- A. \$ 2 400.00
- B. \$ 2 520.00
- C. \$ 2 280.00
- D. \$ 2 394.00

Questions 39–42**Question 39**

Two fair six-sided dice are rolled and the two scores are added. The probability that the total is 8 is

- A. $\frac{5}{36}$
- B. $\frac{1}{36}$
- C. $\frac{1}{6}$
- D. $\frac{2}{9}$

Question 40

At a farm open day, 8 % of the visitors sign the guest book. There are 450 visitors. The expected number of visitors who sign the book is

- A. 8
- B. 36
- C. 450
- D. 414

Question 41

Fergus backs a horse at decimal odds of 3.75 with a \$ 40 stake. If the horse wins, the total returned to him is the stake multiplied by the odds. His profit — the return less his stake — is

- A. \$ 150.00
- B. \$ 110.00
- C. \$ 190.00
- D. \$ 37.50

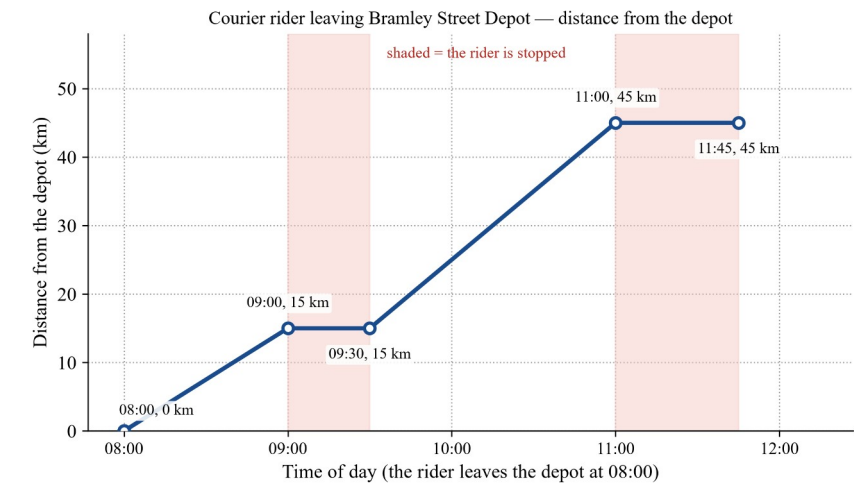
Question 42

A bag holds 3 red, 4 blue and 5 green counters, identical apart from colour. One counter is drawn at random. Listed from least likely to most likely, the colours are

- A. green, blue, red
- B. blue, red, green
- C. red, green, blue
- D. red, blue, green

Questions 43–45

The graph and the table show one morning’s ride for a courier rider who leaves the Bramley Street Depot at 08:00. The shaded bands on the graph are the two times the rider is stopped.



Time	Distance from the depot (km)
08:00	0
09:00	15

Time	Distance from the depot (km)
09:30	15
11:00	45
11:45	45

Question 43

The total time the rider is stopped during the morning is

- A. 30 minutes
- B. 45 minutes
- C. 1 hour 15 minutes
- D. 2 hours 30 minutes

Question 44

The speed on the fastest moving leg of the ride is

- A. 15 km/h
- B. 30 km/h
- C. 12.0 km/h
- D. 20 km/h

Question 45

The average speed for the whole morning, from 08:00 to 11:45, to 1 decimal place, is

- A. 17.5 km/h
- B. 12.0 km/h
- C. 18.0 km/h
- D. 15.0 km/h

Questions 46–48

The table shows five daily takings entered in a spreadsheet, in cells C3 to C7.

Cell	Taking for the day
C3	\$ 480
C4	\$ 520
C5	\$ 465
C6	\$ 590
C7	\$ 545

Question 46

The value returned by the spreadsheet formula =AVERAGE(C3:C7) is

- A. 520
- B. 2 600
- C. 480
- D. 545

Question 47

A kitchen must have three jobs finished before service starts at 6:00 pm. Setting up takes 50 minutes, cooking takes 75 minutes and plating takes 25 minutes, done one after the other in that order. The latest time the kitchen can start setting up is

- A. 3:55 pm
- B. 3:30 pm
- C. 4:45 pm
- D. 8:30 pm

Question 48

A metal bracket is cut to a target length of 480 mm with a tolerance of ± 2 mm. Which of these measured lengths is within the tolerance

- A. 481.0 mm
- B. 477.5 mm
- C. 482.5 mm
- D. 484.0 mm

Questions 49–50**Question 49**

The Fern Street community kitchen served 1 980 meals over 41 weeks. The best estimate of the number of meals it served each week is

- A. 5
- B. 500
- C. 50
- D. 40

Question 50

In one year a region with 460 000 people recorded 2 070 cases of a notifiable illness. The rate of cases per 100 000 people in the region that year is

- A. 450
- B. 45
- C. 4 500
- D. 4.5

End of Practice Set 2

Chapter 14 GAT Section A numeracy practice — Answers and fully-worked solutions

This section gives the answers and the fully-worked solutions for the two GAT Section A numeracy practice sets: **14A** (practice set 1) and **14B** (practice set 2). Each set has 50 multiple-choice questions worth 1 mark each. An answer is rounded only where the question asks for it, and the precision the question states is restated at every rounding step. Every answer below is machine-checked against the questions in the two practice sets.

14A — Answers

Questions 1–25

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o										1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
n	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
A	A	B	B	A	A	D	A	D	D	C	C	C	A	D	B	B	C	A	C	D	C	B	C	A	B

Questions 26–50

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o	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	5
n	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
A	D	C	B	D	A	B	A	D	C	B	B	B	C	B	A	D	C	A	B	C	A	C	D	D	C

14A — Fully-worked solutions

Question	Answer	Working
1	A	4 jars of honey: $4 \times \$8.50 = \$34.00$. 3 candles: $3 \times \$12.40 = \$37.20$. Total: $\$34.00 + \$37.20 = \$71.20$. Option B counts only 1 candle ($\$34.00 + \$12.40 = \$46.40$); option C swaps the two amounts (3 jars of honey and 4 candles: $\$25.50 + \$49.60 = \$75.10$); option D adds 3 jars of jam as well ($\$34.00 + \$18.60 + \$37.20 = \$89.80$).
2	B	15% of the takings: $\$860 \times 0.15 = \$129.00$. Option A is 10% of \$860; option C is what the stall keeps ($\$860 - \$129 = \$731$), not what it pays; option D adds the payment on top of the takings ($\$860 + \$129 = \$989$).
3	B	The exact total is \$71.20 (Question 1). A quick estimate: about

Question	Answer	Working
		$4 \times \$8.50 = \$34$ plus about $3 \times \$12 = \$36$, about \$70. Of the four options, \$70 is closest to \$71.20. Option A (\$35) is about half the total; option C (\$105) and option D (\$700) are too far away — D is out by a factor of 10.
4	A	Coldest means lowest temperature. In order from lowest to highest: Friday (-7°C), Tuesday (-5°C), Monday (-2°C), Thursday (1°C), Wednesday (3°C). Option B is the reverse order (warmest first); options C and D are not sorted by temperature at all (D is simply the order of the days of the week).
5	A	“Warmer than ... by” means subtract the lower temperature from the higher: $3 - (-7) = 3 + 7 = 10^{\circ}\text{C}$. Option C (-4°C) computes $3 - 7$, treating the Friday temperature as $+7$; option B (4°C) is that wrong result with its sign dropped; option D (-10°C) subtracts in the wrong order.
6	D	The bed is a square, so side $\times$ side = 144. Since $12 \times 12 = 144$, each side is 12 m. Option A (14.4 m) misplaces the decimal point of 144; option B (36 m) is $144 \div 4$; option C (72 m) is half of 144.
7	A	The ratio 2:5 splits the money into $2 + 5 = 7$ equal parts. One part: $\$840 \div 7 = \$120$. Tools get 2 parts: $2 \times \$120 = \$240$. Option B takes $\frac{2}{5}$ of \$840 (\$336) — the ratio 2:5 means 2 of every 7 dollars, not 2 of every 5; option C splits the money in half; option D (\$600) is the plants’ share (5 parts).
8	D	$\frac{3}{8} = 3 \div 8 = 0.375$. To write it as a percentage, multiply by 100: $0.375 \times 100 = 37.5\%$. Option A reads the decimal 0.375 straight off as a percentage; option B slips the decimal point; option C rounds to 38%, which the question does not ask for.
9	D	A rise of 15% keeps 115% of the

Question	Answer	Working
		old price: $\\$3.20 \times 1.15 = \\$3.68$. Check: 15 % of $\\$3.20$ is $\\$0.48$, and $\\$3.20 + \\$0.48 = \\$3.68$. Option A subtracts 15 % instead of adding it ($\\$3.20 \times 0.85 = \\$2.72$); option B adds 15 cents rather than 15 %; option C adds 10 % ($\\$3.52$).
10	C	Use the rule in the order it is written: first multiply, then add. $1.8 \times 180 = 324$, then $324 + 32 = 356$ °F. Option A only adds the 32 ($180 + 32 = 212$); option B only multiplies (324 °F); option D adds first and then multiplies ($(180 + 32) \times 1.8 = 381.6$) — the wrong order.
11	C	A regular hexagon has 6 lines of symmetry: 3 lines through opposite corners and 3 lines through the midpoints of opposite sides. Options A (2) and B (3) each count only one family of lines; option D (12) counts corners and sides instead of folding lines.
12	C	Angles in a triangle add to 180°. The two base angles are equal, so together they make $180^\circ - 40^\circ = 140^\circ$, and each one is $140^\circ \div 2 = 70^\circ$. Option A halves the top angle instead; option B computes $90^\circ - 40^\circ$; option D is the sum of the two base angles, not one base angle.
13	A	Scale factor = new width $\div$ original width = $25 \div 10 = 2.5$. Option B divides the wrong way round ($10 \div 25 = 0.4$); option C is the difference of the widths ($25 - 10 = 15$); option D is their sum (35).
14	D	Lengths scale by $k = 2.5$, so areas scale by $k^2 = 2.5^2 = 6.25$. Poster area: $40 \times 6.25 = 250$ cm². Option A scales the area by k instead of k^2 ($40 \times 2.5 = 100$ cm²); option B is 25×25, the area of a square 25 cm wide; option C leaves the area unchanged.
15	B	The model is $\frac{1}{18}$ of the real size: $4.32 \div 18 = 0.24$ m. Convert to

Question	Answer	Working
		centimetres: $0.24 \text{ m} = 24 \text{ cm}$. Option A is out by a factor of 10 (2.4 cm); option C is out by a factor of 10 the other way (240 cm); option D multiplies by 18 instead of dividing ($432 \times 18 = 7\,776$).
16	B	The description — a flat circular base, a curved wall the same width all the way up, and a flat circular top — is a cylinder . A cone (option A) tapers to a point; a sphere (option C) has no flat faces; a rectangular prism (option D) has flat rectangular faces and no curved wall.
17	C	Count the edges: 4 edges around the square base, plus 4 sloping edges that meet at the top point — $4 + 4 = 8$ edges in total. Option A counts only the base; option B is the number of corners (5: four base corners plus the top point); option D overcounts (a square-based pyramid has 5 faces, 5 corners and 8 edges — 12 is none of these).
18	A	Two sides of the plan are not labelled: the inner horizontal side is $8 - 5 = 3 \text{ m}$ and the inner vertical side is $6 - 4 = 2 \text{ m}$. Area of the full 8×6 rectangle: 48 m^2 . Take away the missing 3×2 corner: $48 - 6 = 42 \text{ m}^2$. (Check by splitting: $8 \times 4 = 32 \text{ m}^2$ for the lower rectangle plus $5 \times 2 = 10 \text{ m}^2$ for the upper one gives 42 m^2 .) Option B subtracts 3 instead of the 6 m^2 corner; option C forgets the cut-out corner; option D adds it.
19	C	Add every outer side, including the two unlabelled ones (3 m and 2 m): $8 + 4 + 3 + 2 + 5 + 6 = 28 \text{ m}$. Option A leaves out the two right-hand sides (4 m and 2 m); option B leaves out the 5 m top; option D is the area (42), not the perimeter.
20	D	Cost = area $\times$ price per square metre = $42 \times \$45 = \$1\,890$. Option A uses the perimeter ($28 \times 45 = \$1\,260$); option B uses the full-rectangle area of 48 m^2 ($\$2\,160$); option C uses 54 m^2 ($\$2\,430$).
21	C	Volume = floor area $\times$ height

Question	Answer	Working
		$= 42 \times 2.6 = 109.2 \text{ m}^3$. Option A uses the perimeter instead of the area ($28 \times 2.6 = 72.8$); option B uses a wrong floor area ($8 \times 5 = 40 \text{ m}^2$, giving 104); option D uses 48 m^2 (124.8).
22	B	Volume of a cylinder $= \pi r^2 h$: $\pi \times 0.6^2 \times 1.5 = \pi \times 0.54 \approx 1.69646 \text{ m}^3$. Convert: $1.69646 \text{ m}^3 \times 1000 = 1696.46 \text{ L}$. To the nearest litre, the capacity is 1696 L. Option A is half the tank (848 L); option C forgets to square the radius ($\pi \times 0.6 \times 1.5 \times 1000 \approx 2827 \text{ L}$); option D uses the diameter 1.2 m as the radius ($\approx 6786 \text{ L}$).
23	C	Time = capacity $\div$ rate: $1696.46 \div 15 \approx 113.10$ minutes. To the nearest minute, that is 113 minutes. Convert: 113 minutes $= 60 + 53 = 1$ hour 53 minutes. Option A fills only the 848 L half-tank ($848 \div 15 \approx 57$ minutes); option B misreads 113 minutes as “1 hour 13 minutes”; option D uses the wrong capacity ($2827 \div 15 \approx 188$ minutes = 3 hours 8 minutes).
24	A	$1696.46 \div 120 \approx 14.14$. Only full days count, so the tank supplies the farm for 14 full days — a 15th day would need $15 \times 120 = 1800 \text{ L}$, which is more than the tank holds. Option B is the unrounded decimal, which is not a number of full days; option C rounds up; option D is out by a factor of 10.
25	B	14:00 is 12 noon plus 2 hours, so it is 2:00 in the afternoon: 2:00 pm. Option A is the morning; option C subtracts 10 from 14 instead of 12; option D mixes the two systems — 24-hour time never carries “pm”.
26	D	Split the shift at midnight: 22:00 to 24:00 is 2 hours, and 00:00 to 06:30 is 6 hours 30 minutes. Total: 8 hours 30 minutes. Option A counts only the part after midnight; option B counts 22:00 to midnight as 3 hours instead of 2; option C subtracts ($22 - 6.5 = 15.5$ hours) instead of crossing midnight.

Question	Answer	Working
27	C	Pay = hours $\times$ rate: $8.5 \times \\$28.40 = \\$241.40$. Option A pays only the 8 whole hours ($8 \times \\$28.40 = \\$227.20$); option B is a slip in typing the answer (\$241.04 against \$241.40); option D doubles the shift ($17 \times \\$28.40 = \\$482.80$).
28	B	Perth (UTC + 8) is $10 - 8 = 2$ hours behind Melbourne (UTC + 10). $15:30 - 2:00 = 13:30$. Option A drops the 30 minutes as well; option C ignores the time difference; option D adds 2 hours instead of subtracting.
29	D	Count the 100 km lots: $320 \div 100 = 3.2$. Fuel used: $3.2 \times 8.5 = 27.2$ L. Option A is out by a factor of 10 (2.72 L); option B is out by a factor of 10 the other way (272 L); option C divides instead of multiplying ($320 \div 8.5 \approx 37.6$ L).
30	A	Cost = litres $\times$ price per litre: $27.2 \times \\$1.82 = \\$49.504$. To the nearest cent, the cost is \$49.50 — the third decimal is 4, so the cents digit stays. Option B rounds \$49.504 up to \$49.51, which is not the nearest cent; option C uses the wrong fuel amount from Question 29 ($37.65 \times 1.82 \approx \\$68.52$); option D is out by a factor of 10.
31	B	Real length = map length $\times$ scale factor: $8 \times 25\,000 = 200\,000$ cm. Convert: $200\,000$ cm = $2\,000$ m = 2 km. Option A converts to 200 m, out by a factor of 10; options C and D are out by further factors of 10.
32	A	A grid reference is written (column letter)(row number). The pool sits in column D, row 4, so its grid reference is D4 — the same pattern as the hospital at E2 given in the question. Option B reverses the two parts; option C reads the wrong row; option D reads the wrong column.
33	D	North is up the map, and the columns run west to east. From the station (B2) to the pool (D4): the column letter moves $B \rightarrow D$ (east) and the row number moves $2 \rightarrow 4$ (north). So the pool is north-east of

Question	Answer	Working
34	C	the station. Options A, B and C reverse one or both of those directions. The shortest grid route from the school (C5) to the station (B2) moves 1 block across (C → B) and 3 blocks down (5 → 2): $1 + 3 = 4$ blocks. Distance: $4 \times 150 = 600$ m. Option A counts only the 1 across block; option B counts only the 3 down blocks; option D counts 5 blocks.
35	B	Vertically opposite angles (the angles opposite each other where two straight lines cross) are equal, so the answer is 52°. Option A is $90^\circ - 52^\circ$; option D is the angle beside it on a straight line ($180^\circ - 52^\circ = 128^\circ$); option C doubles the angle.
36	B	Sort the goals first: 12, 13, 13, 14, 14, 15, 15, 46. With $n = 8$ values, the median lies halfway between the 4th and 5th: $\frac{14 + 14}{2} = 14$. Option A takes the middle two values of the list as printed (14 and 13, giving 13.5) — sorting first is essential; option C picks a single middle-looking value; option D is the mean, not the median.
37	B	Sum of the goals: $15 + 12 + 46 + 14 + 13 + 15 + 14 + 13 = 142$. Mean = $142 \div 8 = 17.75$. Correct to 1 decimal place, the mean is 17.8 (the second decimal is 5, so round the 7 up). Option A (14.0) is near the median, not the mean; option C truncates to 17.7 instead of rounding; option D leaves the answer at 2 decimal places when 1 was asked for.
38	C	In the sorted data, the gaps between neighbouring values are all 0 or 1 — except the gap from 15 up to 46, which is 31. A gap that far above the rest marks 46 as the outlier. Option A (12) sits only 1 below the next value; option B (15) is inside the cluster; option D denies a gap that is plainly there.

Question	Answer	Working
39	B	The outlier 46 pulls the mean up to 17.75, well above the 12–15 goals Kiri scored in her other seven games. The median (14) ignores how extreme the outlier is, so it better summarises a typical game. Option A recommends the mean despite the outlier; option C’s “always the best” rule is false — this data set is the counter-example; option D’s reason is a false rule (the median is not always smaller than the mean — it depends on the data).
40	A	The responses are names of sports — words in categories, not numbers — so the variable is categorical. Options B and C need numerical responses (counts or measurements); option D is false, because the response changes from member to member, which is what makes it a variable.
41	D	Soccer’s share: $\frac{24}{60} = 0.4$ of the members. Sector angle $= 0.4 \times 360^\circ = 144^\circ$. Option A uses the raw count as an angle; option B is the share as a percentage (40%), not an angle; option C multiplies $0.24 \times 360^\circ = 86.4^\circ$, reading the count 24 as a decimal fraction.
42	C	$\frac{12}{60} = \frac{1}{5} = 0.2$, and $0.2 \times 100 = 20\%$. Option A inverts the fraction ($60 \div 12 = 5$); option B reads the count (12) straight off as a percentage; option D is basketball’s share ($\frac{15}{60} = 25\%$).
43	A	Probability = winning tickets $\div$ total tickets $= \frac{5}{40}$. Divide top and bottom by 5: $\frac{1}{8}$. Option B puts the number of winning tickets in the denominator; option C is the chance of one particular named ticket winning; option D ($\frac{7}{8}$) is the probability of not winning ($\frac{35}{40}$).

Question	Answer	Working
44	B	$\frac{1}{8} = 1 \div 8 = 0.125$, and $0.125 \times 100 = 12.5\%$. Option A is out by a factor of 10; option C turns the denominator (8) into a percentage; option D truncates 12.5 to 12.
45	C	The same fraction of tickets wins: $\frac{1}{8}$ of $240 = 240 \div 8 = 30$ winning tickets. Option A is this year's number; option B uses $\frac{1}{10}$ ($240 \div 10 = 24$); option D uses $\frac{1}{5}$ ($240 \div 5 = 48$).
46	A	Count the equally likely outcomes: 2 coin results $\times$ 6 die results = 12 outcomes, and only one of them is (head, 4). So the probability is $\frac{1}{12}$. Option B treats the outcome count as $6 + 1 = 7$ — outcomes are multiplied, not added; option C ignores the coin ($\frac{1}{6}$); option D ignores the die ($\frac{1}{2}$).
47	C	Risk score = likelihood $\times$ consequence = $4 \times 3 = 12$. The zones put a score of 10–14 in high risk, so the hazard scores 12, high risk. Option A adds instead of multiplying ($4 + 3 = 7$); option B places 12 in the medium zone (5–9); option D places it in the extreme zone (15–25).
48	D	Cell D2 holds $=B2 * C2$: hours $\times$ rate = $6.5 \times 48 = \$312.00$. Option A uses 6 hours instead of 6.5 ($6 \times 48 = \$288.00$); option B adds the two cells instead of multiplying ($6.5 + 48 = 54.5$); option C is out by a factor of 10 ($\$3120.00$).
49	D	First work out each job's cost: Job 1 $6.5 \times 48 = \$312.00$; Job 2 $4.5 \times 40 = \$180.00$; Job 3 $5.5 \times 41 = \$225.50$; Job 4 $3 \times 32 = \$96.00$. Then $=SUM(D2:D5)$ adds them: $\$312.00 + \$180.00 + \$225.50 + \$96.00 = \$813.50$. Option A adds only Jobs 1 and 4 ($\$312.00 + \$96.00 = \$408.00$).

Question	Answer	Working
50	C	\$ 312 + \$ 96 = \$ 408); option B is the mean cost ($\\$ 813.50 \div 4 \approx \\$ 203.38$), which is what =AVERAGE (D2 : D5) returns; option C is what =COUNT (D2 : D5) returns (4 jobs). Set the two costs equal: $15 + 0.60 p = 45 + 0.30 p$, where p is the number of pages. Subtract $0.30 p$ from both sides: $15 + 0.30 p = 45$. Subtract 15: $0.30 p = 30$. Divide: $p = 100$. Check: at 100 pages, plan A costs \$ 15 + \$ 60 = \$ 75 and plan B costs \$ 45 + \$ 30 = \$ 75 — equal. Option A divides 30 by the wrong rate ($30 \div 0.60 = 50$); option B fails the check (60 pages: plan A \$ 51, plan B \$ 63); option D ignores plan A's fixed fee ($45 \div 0.30 = 150$).

14B — Answers

Questions 1–25

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n	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	
A	A	B	D	A	B	C	D	A	D	B	A	C	D	C	D	B	D	D	A	B	C	B	D	C	C	

Questions 26–50

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n	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
A	A	A	B	D	C	B	B	D	A	C	D	A	D	A	B	B	D	C	D	B	A	B	A	C	A

14B — Fully-worked solutions

Question	Answer	Working
1	A	1 L = 1 000 mL, so the large carton holds 10 lots of 100 mL. Cost per 100 mL: $\\$6.60 \div 10 = \\$0.66$. Option B is the 600 mL carton's rate per 100 mL ($\\$4.08 \div 6 = \\$0.68$) — a different carton; option C is the price of the whole carton; option D divides by 100 instead of 10 ($\\$6.60 \div 100 \approx \\$0.07$).
2	B	The \$52.80 already includes the GST, so the GST is $\frac{10}{110}$ of it: $\$52.80 \times \frac{10}{110} = \$52.80 \div 11 = \$4.80$. Check: the price before GST is $\\$52.80 \div 1.1 = \\$48.00$, and 10 % of \$48.00 is \$4.80. Option A takes 10 % of the GST-inclusive price (\$5.28); option C is about 11 % of \$52.80 (\$5.81); option D is the price before GST, not the GST itself.
3	D	The rise is $\\$5.00 - \\$4.00 = \\$1.00$.

Question	Answer	Working
		Percentage increase $= \frac{1.00}{4.00} = 0.25 = 25\% \text{ — divided by the original price, because the increase is measured from where the price started. Option A divides by the new price instead } (\frac{1}{5} = 20\%);$ option B is the old price as a percentage of the new (80 %); option C is the new price as a percentage of the old (125 %).
4	A	Eight single cans cost $8 \times \$2.15 = \$17.20.$ The saving is $\\$17.20 - \\$14.00 = \\$3.20$. Option B is just the price of the 8-pack; option C is the cost of the 8 singles — the amount before the saving is taken off; option D is the saving per can ($\\$3.20 \div 8 = \\$0.40$), not the total saving.
5	B	First 38 hours: $38 \times \$34.80 = \$1\,322.40.$ Time-and-a-half rate: $\$34.80 \times 1.5 = \$52.20 \text{ an hour.}$ Overtime hours: $44 - 38 = 6$, so $6 \times \$52.20 = \$313.20.$ Total pay: $\\$1\,322.40 + \\$313.20 = \\$1\,635.60$. Option A pays all 44 hours at the ordinary rate ($44 \times \\$34.80 = \\$1\,531.20$); option C is only the overtime part; option D is only the first 38 hours.
6	C	80 cents = \$0.80. Allowance $= 135 \times \$0.80 = \$108.00.$ Option A uses 8 cents per km; option B divides instead of multiplying ($135 \div 0.80 = \\$168.75$); option D is out by a factor of 10 (\$1 080.00).
7	D	The decimal part is a fraction of an hour, not a number of minutes: $0.2 \text{ hours} = 0.2 \times 60 = 12 \text{ minutes}$. So 8.2 hours is 8 hours 12 minutes. Option A reads the 0.2 as 20 minutes; option B reads it as 2 minutes; option C converts 8.5 hours instead.
8	A	One full cycle is $4 + 2 = 6$ days. In 30 days there are $30 \div 6 = 5$ full cycles, and each cycle has 4 days on: $5 \times 4 = 20$ days worked. Option

Question	Answer	Working
9	D	B assumes a 5-day cycle ($30 \div 5 \times 4 = 24$); option C assumes half the days are worked; option D is the number of days off ($5 \times 2 = 10$). Add the five changes: $-3 + 2 - 5 + 4 - 1 = -3$. Mean $= -3 \div 5 = -0.6$ parcels per week — negative, meaning deliveries fell on average. Option A drops the minus sign; option B is the total change over the five weeks, not the mean per week; option C is the mean with every sign made positive ($15 \div 5 = 3$), which hides the direction of the changes.
10	B	Number of pavers = pad area $\div$ area of one paver = $7.2 \div 0.06 = 120$. Option A is out by a factor of 10 (12); option C is out by a factor of 10 the other way (1 200); option D multiplies instead of dividing ($7.2 \times 6 = 43.2$).
11	A	Convert tonnes to kilograms: 1.8 t = 1 800 kg. Number of bags = $1\,800 \div 20 = 90$. Option B (9) comes from converting the tonnes wrongly first ($180 \div 20$); option C (180) is $1\,800 \div 10$; option D (36 000) multiplies instead of dividing ($1\,800 \times 20$).
12	C	The scale statement on the plan: 2 cm represents 5 m, so 1 cm represents 2.5 m. Real length = $6.4 \times 2.5 = 16$ m. Option A uses 1 cm = 5 m — but the 5 m belongs to 2 cm, not 1 cm; option B divides instead of multiplying ($6.4 \div 2.5 = 2.56$); option D is out by a factor of 10 (160 m).
13	D	Rectangular part: $6 \times 5 = 30$ m². The semicircular end sits on a 5 m side, so its radius is 2.5 m: $\frac{1}{2} \times \pi \times 2.5^2 = \frac{1}{2} \times \pi \times 6.25 \approx 9.82$ m². Total $\approx 30 + 9.82 = 39.82$ m², which to the nearest square metre is 40 m². Option A counts only the rectangle; option B adds a full circle instead of a semicircle ($30 + 19.63 \approx 49.6$, rounding to 50); option C uses the 5 m diameter as

Question	Answer	Working
		the radius $(30 + \frac{1}{2}\pi \times 25 \approx 69.3$, rounding to 69). Using the Question 13 answer: area = 40 m^2. Volume of topsoil = $40 \times 0.15 = 6 \text{ m}^3$. Cost = $6 \times \\$86 = \\$516.00$. Option A forgets the depth ($40 \times \\$86 = \\$3440.00$); option B uses a depth of 1.5 m instead of 0.15 m (60 m^3, giving $\\$5160.00$); option D is out by a factor of 10 ($\\$51.60$).
14	C	
15	D	Split at midnight: 23:40 to 24:00 is 20 minutes, and 00:00 to 06:55 is 6 hours 55 minutes. Total elapsed time = 7 hours 15 minutes. Take away the rest stop: 7 h 15 min – 50 min = 6 hours 25 minutes travelling. Option A forgets to subtract the rest stop; option B adds the 50 minutes instead of subtracting them; option C subtracts 1 hour 40 minutes — double the rest stop.
16	B	UTC + 10 to UTC – 10 is a gap of 20 hours, and the cousin is behind. 09:45 Monday less 20 hours = 13:45 Sunday — the calculation crosses midnight back into the day before. Option A goes back only 10 hours (that is UTC, not UTC – 10); option C adds 20 hours instead of subtracting, landing on Tuesday; option D has the right clock time but the wrong day.
17	D	Convert the time to hours: 4 h 50 min = $4 + \frac{50}{60} = \frac{29}{6} \approx 4.8333$ hours. Speed $= 342 \div \frac{29}{6} = \frac{342 \times 6}{29} = \frac{2052}{29} \approx 70.75$ km/h. To 1 decimal place that is 70.8 km/h — the hundredths digit is 5, so round the 7 up. Option A ignores the 50 minutes ($342 \div 4 = 85.5$); option B reads 50 minutes as 0.5 of an hour ($342 \div 4.5 = 76.0$); option C truncates to 70.7 instead of rounding.
18	D	Kilometres beyond the first 5:

Question	Answer	Working
		$22 - 5 = 17$. Extra cost: $17 \times \$1.35 = \$22.95$. Fare: $\$4.60 + \$22.95 = \$27.55$. Option A charges all 22 km at \$1.35 (\$29.70); option B does that and then adds the \$4.60 on top (\$34.30); option C charges for only 1 extra km ($\$4.60 + \$1.35 = \$5.95$).
19	A	Read the five masses off the column graph: March 124 kg, April 96 kg, May 138 kg, June 112 kg, July 158 kg. Total $= 124 + 96 + 138 + 112 + 158 = 628$ kg. Options B (618) and D (638) are addition slips of 10 kg either way; option C is July's mass alone — the largest single month, not the total.
20	B	Work out each month's change: March to April $96 - 124 = -28$ kg; April to May $138 - 96 = +42$ kg; May to June $112 - 138 = -26$ kg; June to July $158 - 112 = +46$ kg. The greatest increase is +46 kg, which lands in July. Option A (May, +42 kg) is the second-largest increase; options C and D are months when the mass fell — decreases, not increases.
21	C	Sort the masses: 96, 112, 124, 138, 158. With 5 values, the median is the middle one — the third: 124 kg. Option A (138) is the fourth value in the sorted list; option B (125.6) is the mean ($628 \div 5$), not the median; option D (96) is the smallest value.
22	B	Range = highest – lowest $= 158 - 96 = 62$ kg. Option A adds the two extremes instead of subtracting them ($158 + 96 = 254$); option C is the highest value on its own; option D is the lowest value on its own.
23	D	The question asks about the under-30 residents only: $\frac{104}{160} = 0.65 = 65\%$. Option A uses all 250 residents as the denominator ($\frac{104}{250} = 41.6\%$, rounding to 42%);

Question	Answer	Working
		option B is the 30-and-over group's rate ($\frac{54}{90} = 60\%$); option C is the overall rate ($\frac{158}{250} = 63.2\%$, rounding to 63%).
24	C	Medicine needed: $24 \times 25 = 600$ mg. The suspension carries 60 mg in every mL, so volume $= 600 \div 60 = 10$ mL. Option A is the child's mass read straight back; option B is the dose in mg, not the volume in mL; option D divides the mass by the concentration ($24 \div 60 = 0.4$).
25	C	Maximum heart rate $= 220 - 32 = 188$ beats per minute. Training rate = 60 % of $188 = 0.6 \times 188 = 112.8$, which to the nearest whole beat is 113 bpm. Option A is the maximum itself, not 60 % of it; option B takes 60 % of 220 and forgets to subtract the age (132); option D truncates 112.8 instead of rounding up.
26	A	Colin eats $\frac{250}{400} = \frac{5}{8}$ of a portion. Energy $= 1580 \times \frac{5}{8} = 987.5$ kJ. To the nearest whole kJ, 987.5 rounds up to 988 kJ. Option D (987) truncates the exact half instead of rounding up; option B subtracts the grams eaten ($1580 - 250 = 1330$); option C multiplies the wrong way round ($1580 \times \frac{400}{250} = 2528$).
27	A	Pounds to kilograms means dividing: $187 \div 2.205 \approx 84.8073$. To 1 decimal place, that is 84.8 kg. Option B rounds the conversion factor to 2.2 first ($187 \div 2.2 \approx 85.0$); option C multiplies instead of dividing ($187 \times 2.205 \approx 412.3$); option D is out by a factor of 10.
28	B	Follow the rule in order: subtract 32: $99.5 - 32 = 67.5$; then divide by 1.8 : $67.5 \div 1.8 = 37.5$ °C exactly. Option A skips the subtraction ($99.5 \div 1.8 \approx 55.3$); option C stops after the first step (67.5); option D

Question	Answer	Working
29	D	adds 32 instead of subtracting it ($(99.5 + 32) \div 1.8 \approx 73.1$). The map's scale is 1 : 40 000: 1 cm represents 400 m. Real distance = $3.5 \times 400 = 1\,400$ m. Option A is out by a factor of 10; option B forgets to convert the ground distance from cm to m ($3.5 \times 40\,000 = 140\,000$ cm, which is 1 400 m); option C is the distance for just 1 cm of map.
30	C	A 16-point compass splits the full turn into steps of $360^\circ \div 16 = 22.5^\circ$. Counting from north: N 0°, NNE 22.5°, NE 45°, ENE 67.5°, E 90°, ESE 112.5°, SE 135°, SSE 157.5°, S 180°, SSW 202.5°, SW 225°, WSW 247.5°. So 247.5° is exactly west-south-west. Option A (west-north-west) is 292.5°; option B (south-west) is 225°; option D (south-south-west) is 202.5°.
31	B	Real length of the leg = $5.0 \times 400 = 2\,000$ m = 2 km. Time = distance $\div$ speed = $2 \div 5 = 0.4$ hours. Convert to minutes: $0.4 \times 60 = 24$ min. Option A is half the correct time; option C is the time to walk 5 km — reading the 5.0 cm as 5 km; option D multiplies instead of dividing ($2 \times 5 = 10$).
32	B	The minute hand moves 6° per minute: at 20 minutes past, it is $20 \times 6^\circ = 120^\circ$ from the 12. The hour hand moves 30° per hour plus 0.5° per minute: at 2:20 it is $2 \times 30^\circ + 20 \times 0.5^\circ = 60^\circ + 10^\circ = 70^\circ$ from the 12. Angle between the hands = $120^\circ - 70^\circ = 50^\circ$. Option A ignores the hour hand's extra 10°; option C is the minute hand's angle from the 12, not the angle between the hands; option D is the supplement ($180^\circ - 50^\circ = 130^\circ$).
33	D	Angle sum of a pentagon = $(5 - 2) \times 180^\circ = 540^\circ$. A regular pentagon has 5 equal angles: $540^\circ \div 5 = 108^\circ$. Option A ($120^\circ$) is

Question	Answer	Working
		the interior angle of a regular hexagon ; option B (135°) is for a regular octagon; option C (540°) is the sum of all five angles, not one angle.
34	A	Oats are 3 parts and weigh 60 kg, so 1 part = $60 \div 3 = 20$ kg. Lupins are 2 parts: $2 \times 20 = 40$ kg. Option B is the barley share (5 parts = 100 kg); option C is the whole batch (10 parts = 200 kg); option D takes $\frac{2}{5}$ of the oats' mass ($60 \times 0.4 = 24$ kg).
35	C	Take the call-out fee off the budget first: $\$200 - \$60 = \$140$ left for the work. $\$140 \div \$25 = 5.6$, so the greatest whole number of hours is 5. Check: 5 hours costs $\$60 + \$125 = \$185$ (within budget); 6 hours costs $\$60 + \$150 = \$210$ (over budget). Option A ignores the call-out fee ($\$200 \div \$25 = 8$); option B rounds 5.6 up, which busts the budget; option D rounds down too far, leaving \$40 unspent — more than an hour's worth of work.
36	D	Simple interest $= P \times r \times t = \$6\,200 \times 0.045 \times 4 = \$1\,116.00$. Option A is the interest for one year only (\$279.00); option B is the maturity value — principal plus interest (\$7\,316.00) — not the interest on its own; option C is out by a factor of 10 (\$111.60).
37	A	Total paid on terms: deposit + 24 payments $= \$250 + 24 \times \$68 = \$250 + \$1\,632 = \$1\,882$. Extra over the cash price: $\$1\,882 - \$1\,580 = \$302.00$. Option B is the total paid on terms, not the extra; option C is the 24 payments alone, leaving out the deposit; option D double-counts the deposit ($\$302 + \$250 = \$552$).
38	D	The rise and the fall act on different amounts , so they do not cancel. After the rise: $\$2\,400 \times 1.05 = \$2\,520$. After the fall: $\$2\,520 \times 0.95 = \$2\,394.00$. Option A assumes +5% then -5%

Question	Answer	Working
		returns to the starting figure; option B stops after the rise; option C applies only the fall, to the original \$ 2 400 (\$ 2 280).
39	A	Two dice give $6 \times 6 = 36$ equally likely outcomes. The outcomes that total 8 are $(2, 6), (3, 5), (4, 4), (5, 3), (6, 2)$ — 5 of them. Probability = $\frac{5}{36}$. Option B counts only one of the five pairs; option C ($\frac{1}{6} = \frac{6}{36}$) counts 6 outcomes; option D ($\frac{2}{9} = \frac{8}{36}$) counts 8.
40	B	Expected number = 8 % of $450 = 0.08 \times 450 = 36$ visitors. Option A reads the percentage straight off as a count; option C is every visitor; option D is the number who do not sign ($450 - 36 = 414$).
41	B	Total return = stake $\times$ odds $= \\$ 40 \times 3.75 = \\$ 150.00$. Profit = return – stake $= \\$ 150.00 - \\$ 40.00 = \\$ 110.00$. Option A is the total return, which still includes Fergus’s own stake coming back; option C adds the stake on instead of subtracting it ($\\$ 190.00$); option D divides the return by 4 ($\\$ 37.50$) instead of subtracting the stake.
42	D	The bag holds 3 red, 4 blue and 5 green — 12 counters in all. Fewer counters of a colour means that colour is less likely to be drawn. From least likely to most likely: red (3), blue (4), green (5). Option A is the reverse order (most likely first); option B puts blue before red; option C puts green before blue.
43	C	The rider is stopped whenever the distance is not changing — the flat parts of the graph and the shaded bands: 09:00 to 09:30 (30 minutes, at 15 km) and 11:00 to 11:45 (45 minutes, at 45 km). Total stopped = $30 + 45 = 75$ minutes = 1 hour 15 minutes. Option A counts only the first stop; option B counts only the

Question	Answer	Working
44	D	second; option D (2 hours 30 minutes) is the time the rider was moving, not stopped. There are two moving legs. First: 08:00 to 09:00, 15 km in 1 hour = 15 km/h. Second: 09:30 to 11:00, $45 - 15 = 30$ km in 1.5 hours = $30 \div 1.5 = 20$ km/h. The faster of the two is 20 km/h. Option A is the first leg's speed; option B (30) is the second leg's distance in km, not its speed; option C (12.0 km/h) is the average speed for the whole morning (Question 45).
45	B	The average speed uses the whole morning, stops included. Total distance = 45 km; total time from 08:00 to 11:45 = 3.75 hours. Average speed = $45 \div 3.75 = 12.0$ km/h. Option A averages the two moving speeds ($\frac{15 + 20}{2} = 17.5$), which is not the same thing; option C divides by the 2.5 moving hours only ($45 \div 2.5 = 18.0$); option D is the first leg's speed alone.
46	A	=AVERAGE (C3 : C7) adds the five cells and divides by 5: $(480 + 520 + 465 + 590 + 545) \div 5 = 2$. Option B (2600) is what =SUM (C3 : C7) returns; option C (480) is the first entry in the range (cell C3); option D (545) is the last entry (cell C7).
47	B	Total preparation time = $50 + 75 + 25 = 150$ minutes = 2 hours 30 minutes. Count back from 6:00 pm: 2 hours 30 minutes before 6:00 pm is 3:30 pm. Option A forgets the 25 minutes of plating — it counts back only 2 hours 5 minutes ($50 + 75$); option C counts back only the 75 minutes of cooking; option D adds 2 hours 30 minutes to 6:00 pm instead of subtracting.
48	A	A tolerance of ± 2 mm on a target of 480 mm accepts any length from 478 mm to 482 mm. Only 481.0 mm lies inside that window. Option B (477.5 mm) is 0.5 mm below the

Question	Answer	Working
		lower limit; option C (482.5 mm) is 0.5 mm above the upper limit; option D (484.0 mm) is 2 mm above it.
49	C	Meals per week = $1\,980 \div 41 \approx 48.3$. A quick estimate with rounded numbers: $2\,000 \div 40 = 50$. Of the four options, 50 is closest to 48.3. Option D (40) is 8.3 away — further off than 50 is; options A (5) and B (500) are out by factors of about 10.
50	A	Rate per 100 000 people $= \frac{2\,070}{460\,000} \times 100\,000 = 2\,070 \div 4.6 = 450$ cases per 100 000 people. Options B (45) and D (4.5) are out by factors of 10; option C (4 500) is out by a factor of 10 the other way.

End of fully-worked solutions