Functional Skills
Mathematics
Level 2

Sample Assessment Materials

Functional Skills qualifications
First teaching September 2019
Edexcel, BTEC and LCCI qualifications
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Marking Guidance for Functional Skills Mathematics Level 1 and 2

General
1. All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
2. Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme, the response should be escalated to a senior examiner to review.
3. Mark schemes should be applied positively. Learners must be rewarded for what they have shown they can do rather than penalised for omissions.
4. All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the learner’s response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no answer) indicated in the answer box, always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.
5. Working is always expected. For short questions where working may not be seen, correct answers may still be awarded full marks. For longer questions, an answer in brackets from the mark scheme seen in the body of the working, implies a correct process and the appropriate marks may be awarded.
6. Questions that specifically state that working is required: learners who do not show working will get no marks – full details will be given in the mark scheme for each individual question.

Applying the Mark Scheme
7. The mark scheme has a column for Process and a column for Evidence. In most questions the majority of marks are awarded for the process the learner uses to reach an answer. The evidence column shows the most likely examples that will be seen. If the learner gives different evidence valid for the process, examiners should award the mark(s).
8. If working is crossed out and still legible, then it should be marked, as long as it has not been replaced by alternative work.
9. If there is a choice of methods shown, then mark the work leading to the answer given in the answer box or working box. If there is no definitive answer then marks should be awarded for the lowest scoring method shown.
10. A suspected misread, e.g. 528 instead of 523, may still gain process marks provided the question has not been simplified. Examiners should send any instance of a suspected misread to a senior examiner to review.
11. It may be appropriate to ignore subsequent work (isw) when the learner’s additional work does not change the meaning of their answer.
12. Correct working followed by an incorrect decision may be seen, showing that the learner can calculate but does not understand the functional demand of the question. The mark scheme will make clear how to mark these questions.
13. Transcription errors occur when the learner presents a correct answer in working, and writes it incorrectly on the answer box e.g. 698 in the body and 689 in the answer box; mark the better answer if clearly only a transcription error. Examiners should send any instance of transcriptions errors to a senior examiner to review.
14. **Incorrect method** if it is clear from the working that the correct answer has been obtained from incorrect working, award 0 marks. Examiners must escalate the response to a senior examiner to review.

15. **Follow through marks (ft)** must only be awarded when explicitly allowed in the mark scheme. Where the process uses the learner’s answer from a previous step, this is clearly shown.
   - Speech marks are used to show that previously incorrect numerical work is being followed through, for example ‘240’ means their 240 coming from a correct or set of correct processes.
   - When words are used in \{\} then this value does not need to come from a correct process but should be the value the learner believes to be required. The constraints on this value will be detailed in the mark scheme. For example, \{volume\} means the figure may not come from a correct process but is clearly the value learners believe should be used as the volume.

16. Marks can usually be awarded where units are not shown. Where units are required this will be stated. For example, 5(m) indicates that the units do not have to be stated for the mark to be awarded.

17. Learners may present their answers or working in many **equivalent** ways. This is denoted oe in the mark scheme. Repeated addition for multiplication and repeated subtraction for division are common alternative approaches. The mark scheme will specify the minimum required to award these marks.

18. A **range** of answers is often allowed, when a range of answers is given e.g. [12.5, 13] this is the inclusive closed interval.

19. **Accuracy** of figures. Accept an answer which has been rounded or truncated from the correct figure unless other guidance is given. For example, for 12.66.. accept 12.6, 12.7, 12.66, 12.67 or any other more accurate figure.

20. **Probability** answers must be given as a fraction, percentage or decimal. If a learner gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths). If a learner gives the answer as a percentage a % must be used. Incorrect notation should lose the accuracy marks, but be awarded any implied process marks. If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

21. **Graphs.** A linear scale must be linear in the range where data is plotted, and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. The minimum requirements for labels will be given, but examiners should give credit if a title is given which makes the label obvious.
Incorrect method if it is clear from the working that the correct answer has been obtained from incorrect working, award 0 marks. Examiners must escalate the response to a senior examiner to review.

Follow through marks (ft) must only be awarded when explicitly allowed in the mark scheme. Where the process uses the learner’s answer from a previous step, this is clearly shown.

- Speech marks are used to show that previously incorrect numerical work is being followed through, for example ‘240’ means their 240 coming from a correct or set of correct processes.
- When words are used in { } then this value does not need to come from a correct process but should be the value the learner believes to be required. The constraints on this value will be detailed in the mark scheme. For example, {volume} means the figure may not come from a correct process but is clearly the value learners believe should be used as the volume.

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Graphs. A linear scale must be linear in the range where data is plotted, and use consistent intervals. The scale may not start at 0 and not all intervals must be labelled. The minimum requirements for labels will be given, but examiners should give credit if a title is given which makes the label obvious.
Ria works in a paint shop. She needs to make 1500 ml of purple paint.
Ria makes purple paint by mixing red paint and blue paint and white paint in the ratio 3 : 2 : 1.
How much blue paint does Ria need to make 1500 ml of purple paint?

(3) ml
(Total for Question 1 is 3 marks)
SECTION A

Answer ALL questions. Write your answers in the spaces provided.

1. Ria works in a paint shop. She needs to make 1500 ml of purple paint. Ria makes purple paint by mixing red paint and blue paint and white paint in the ratio 3 : 2 : 1.

   How much blue paint does Ria need to make 1500 ml of purple paint?

   (3)

   ml

(Total for Question 1 is 3 marks)
2 Here is some information about the number of houses sold by 20 sales people.

<table>
<thead>
<tr>
<th>Number of houses sold</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 5</td>
<td>7</td>
</tr>
<tr>
<td>6 – 10</td>
<td>6</td>
</tr>
<tr>
<td>11 – 15</td>
<td>5</td>
</tr>
<tr>
<td>16 – 20</td>
<td>2</td>
</tr>
</tbody>
</table>

Work out an estimate for the mean number of houses sold.

(Total for Question 2 is 3 marks)
3 Amanda wants to buy a new mobile phone. 
She sees these two offers for the same mobile phone.

<table>
<thead>
<tr>
<th>Number of houses sold</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1−5</td>
<td>7</td>
</tr>
<tr>
<td>6−10</td>
<td>6</td>
</tr>
<tr>
<td>11−15</td>
<td>5</td>
</tr>
<tr>
<td>16−20</td>
<td>2</td>
</tr>
</tbody>
</table>

Work out an estimate for the mean number of houses sold.

(3)

(Total for Question 2 is 3 marks)

Amanda wants to buy a new mobile phone.
She sees these two offers for the same mobile phone.

**Offer A**
- 2 year contract
- Monthly cost £59
- Mobile phone cost £39.96

**Offer B**
- SIM only
- Monthly cost £11
- Mobile phone cost £889.92

Amanda says,

‘I will save more than £300 in total over 2 years with offer B’.

Use estimation to check if her statement is reasonable.
You **must** show your working.

(4)

(Total for Question 3 is 4 marks)
Matt buys a new fish tank.

The fish tank is in the shape of a cuboid.

The diagram shows water in the tank.

Matt knows

\[1000 \text{ cm}^3 = 1 \text{ litre}\]

\[1 \text{ gallon} = 4.5 \text{ litres}\]

He can keep 2 small fish in the tank for every 1 gallon of water in the tank.

Matt thinks he can keep more than 36 small fish in the tank.

Is Matt correct?
Matt buys a new fish tank. The fish tank is in the shape of a cuboid. The diagram shows water in the tank.

100 cm³ = 1 litre
1 gallon = 4.5 litres

He can keep 2 small fish in the tank for every 1 gallon of water in the tank.

Matt thinks he can keep more than 36 small fish in the tank.

Is Matt correct?
**Question**

Process to multiply a consistent value of number of houses by frequency

1 or

A

e.g. 3 × 7 or 8 × 6 or 13 × 5 or 18 × 2

Allow use of ‘midpoints’ provided they are consistent and within an interval including the end points

OR

21 and 48 and 65 and 36 seen (condone 1 error or omission)

Full process to find the estimate of the mean

2 or

AB

(3 × 7 + 8 × 6 + 13 × 5 + 18 × 2) ÷ (7 + 6 + 5 + 2) (=8.5)

Allow use of ‘midpoints’ provided they are consistent and within an interval including the end points

Accurate figure

3

ABC

8.5

Accept 8 or 9, supported by accurate working

Total marks for question

3
### Level 2 - Section A: Mark Scheme

<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q1</strong></td>
<td>Begins to work with ratio</td>
<td>1 or</td>
<td>A</td>
<td>[1500 \div (3 + 2 + 1) (=250) ] oe</td>
</tr>
<tr>
<td></td>
<td>Full process to find the amount of blue paint</td>
<td>2 or</td>
<td>AB</td>
<td>‘250’ \times 2 (=500) oe]</td>
</tr>
<tr>
<td></td>
<td>Correct answer</td>
<td>3</td>
<td>ABC</td>
<td>500 (ml)</td>
</tr>
<tr>
<td></td>
<td><strong>Total marks for question</strong></td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q2</strong></td>
<td>Process to multiply a consistent value of number of houses by frequency</td>
<td>1 or</td>
<td>A</td>
<td>e.g. (3 \times 7 ) or (8 \times 6 ) or (13 \times 5 ) or (18 \times 2 )]</td>
</tr>
<tr>
<td></td>
<td>Full process to find the estimate of the mean</td>
<td>2 or</td>
<td>AB</td>
<td>((3 \times 7 + 8 \times 6 + 13 \times 5 + 18 \times 2) \div (7 + 6 + 5 + 2) (=8.5)]</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td>3</td>
<td>ABC</td>
<td>8.5]</td>
</tr>
<tr>
<td></td>
<td><strong>Total marks for question</strong></td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Process</td>
<td>Mark</td>
<td>Mark Ref</td>
<td>Evidence</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>Q3</td>
<td>Begins to work with 12 or 24 months, figure could be rounded, or difference in costs using rounded figures</td>
<td>1 or</td>
<td>A</td>
<td>e.g. $60 \times 24 (=1440)$ OR $10 \times 24 (=240)$ OR $60 - 10 (=50)$ OR $900 - 40 (=860)$</td>
</tr>
<tr>
<td></td>
<td>Full process to find total cost of one offer or cost difference over 24 months</td>
<td>2 or</td>
<td>AB</td>
<td>e.g. ‘$1440’ + 40 (=1480)’ or ‘$240’ + 900 (=1140)’ OR ‘$50’ × 24 (=1200)’ Allow using accurate figures for marks A and B only</td>
</tr>
<tr>
<td></td>
<td>Full process to find total savings</td>
<td>3</td>
<td>ABC</td>
<td>e.g. ‘$1480’ – ‘$1140’ (=340)’ oe OR ‘$1200’ – ‘$860’ (=340)’ oe</td>
</tr>
<tr>
<td></td>
<td>Valid decision with accurate figures supported by working.</td>
<td>4</td>
<td>ABCD</td>
<td>e.g. Yes AND (£) 340</td>
</tr>
<tr>
<td><strong>Total marks for question</strong></td>
<td><strong>4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Evidence</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q4</td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Mark Ref</th>
<th>Mark</th>
<th>Process</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1 or</td>
<td>Process to find the volume of water</td>
<td>30 × 100 × 30 (＝90 000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accurate figure for volume of water in cm$^3$</td>
<td>90 000 cm$^3$ oe</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>Process to convert between cm$^3$ and litres</td>
<td>e.g. ‘90 000’ ÷ 1000 (＝90)</td>
</tr>
<tr>
<td>C</td>
<td>1</td>
<td>Uses the conversion rate appropriately or works with proportion</td>
<td>e.g. ‘90 ÷ 4.5 (＝20) oe OR 10 gallons is 45 litres OR 36 ÷ 2 (＝18)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Calculations may be seen using a build-up method</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>1 or</td>
<td>Process to find figures to compare</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Valid decision with accurate figures</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mark Ref</th>
<th>Mark</th>
<th>Process</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE</td>
<td>2 or</td>
<td>Full process to find figures to compare</td>
<td></td>
</tr>
<tr>
<td>DEF</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total marks for question</th>
<th>6</th>
</tr>
</thead>
</table>
You must have:
- Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, pair of compasses.

Instructions
• Use a black ink or ball-point pen.
• Fill in the boxes at the top of this page with your name, centre number and candidate number.
• Sign the declaration.
• Answer all questions.
• Write your final answers in the boxes provided.
• Answer the questions in the spaces provided – there may be more space than you need.
• You must show clearly how you get your answers in the spaces provided. Marks will be awarded for your working out.
• Check your working and your answers at each stage.
• Diagrams are not accurately drawn, unless otherwise indicated.
• If your calculator does not have a π button take the value of π to be 3.14.
• Calculators may be used.

Information
• The total mark for this section is 48
• The total mark for this paper is 64
• The marks for each question are shown in brackets.
  – use this as a guide to how much time to spend on each question.
• This sign shows where marks will be awarded for showing your checks.

Advice
• Read each question carefully before you start to answer it.
• Check your answers if you have time at the end.

My signature confirms that I will not discuss the content of the test with anyone.
Signature: S64853A
Please check the examination details below before entering your candidate information

<table>
<thead>
<tr>
<th>Candidate surname</th>
<th>Other names</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Pearson Edexcel Functional Skills**

**Sample assessment material for first teaching**
September 2019

**Time: 1 hour 30 minutes**

**Paper Reference** SAML2/01

**Mathematics**

**Level 2**

**Section B (Calculator)**

**You must have:**
Pen, calculator, HB pencil, eraser, ruler graduated in cm and mm, protractor, pair of compasses.

My signature confirms that I will not discuss the content of the test with anyone.

Signature: ________________________________

**Instructions**
- Use a **black** ink or ball-point pen.
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- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.
SECTION B

Answer ALL questions. Write your answers in the spaces provided.

1 Data set A has a median value of 3.1

Here is data set B.

14  −9  28  −38  −13  −2

(a) Write a statement to compare the median values of the two sets of data.

(b) Show a check of your answer for the median of data set B.

(Total for Question 1 is 3 marks)

2 Dan throws two fair dice.

The numbers on dice A are 1 −2 3 −4 5 −6

The numbers on dice B are −1 2 −3 4 −5 6

The table shows some total scores from throwing the two dice.

<table>
<thead>
<tr>
<th>Dice A</th>
<th>+</th>
<th>1</th>
<th>−</th>
<th>2</th>
<th>3</th>
<th>−</th>
<th>4</th>
<th>5</th>
<th>−</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dice B</td>
<td>−</td>
<td>1</td>
<td>0</td>
<td>−</td>
<td>3</td>
<td>2</td>
<td>−</td>
<td>5</td>
<td>−</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>−</td>
<td>2</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>−</td>
<td>3</td>
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<td>5</td>
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<td>−</td>
<td>4</td>
<td>−</td>
<td>2</td>
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<td>11</td>
<td></td>
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<tr>
<td></td>
<td>6</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

(a) Complete the table.

(b) What is the probability that the total score is –11?

(c) What is the probability that the new total score is 0?

(Total for Question 2 is 3 marks)
2 Dan throws two fair dice.

The numbers on dice A are 1  -2  3  -4  5  -6
The numbers on dice B are -1  2  -3  4  -5  6

The table shows some total scores from throwing the two dice.

<table>
<thead>
<tr>
<th>Dice A</th>
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<th>-2</th>
<th>3</th>
<th>-4</th>
<th>5</th>
<th>-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>0</td>
<td>-3</td>
<td>2</td>
<td>-5</td>
<td>-7</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>3</td>
<td>5</td>
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<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-3</td>
<td>-2</td>
<td>-5</td>
<td>-7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td></td>
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</tr>
<tr>
<td>-5</td>
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<td>0</td>
<td>-11</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>2</td>
<td>0</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

(a) Complete the table.  

(b) What is the probability that the total score is -11?

(c) What is the probability that the new total score is 0?

(Total for Question 2 is 3 marks)
Last year Zack had two jobs.

Zack worked

- in an office for 12 months and earned £2600 per month
- at a gym for 39 weekends and earned £80 per weekend.

What fraction of his total income last year came from his work at the gym? Write the fraction in its simplest form.

(Total for Question 3 is 4 marks)
Last year Zack had two jobs.

- Zack worked in an office for 12 months and earned £2600 per month.
- Zack worked at a gym for 39 weekends and earned £80 per weekend.

What fraction of his total income last year came from his work at the gym?

Write the fraction in its simplest form.

(Total for Question 3 is 4 marks)

--

Here is a prism.
The cross section of the prism is a pentagon.

Draw the front elevation of the prism on the grid.
Use the scale 1:3

(Total for Question 4 is 3 marks)
Olga has this sketch of the paths in a park.

She wants a cycle route that

• starts and ends at the entrance
• goes through point C at least once
• has a total length between 15 kilometres and 20 kilometres.

1 km = 0.6 miles.

Plan a suitable route.
Work out the total distance of the route.
Olga has this sketch of the paths in a park.

- Entrance
- A
- B
- C
- D

- 2¾ miles
- 2¼ miles
- 4¼ miles
- 1¾ miles
- 5½ miles

She wants a cycle route that
• starts and ends at the entrance
• goes through point C at least once
• has a total length between 15 and 20 kilometers.

1 km = 0.6 miles.

Plan a suitable route.

Work out the total distance of the route.

(Total for Question 5 is 5 marks)
Here is a cube of side length 2.5 cm.

Work out the surface area of this cube.

(Total for Question 6 is 3 marks)
Megan is the manager of a computer shop. She organises a sale with 18% off all tablets.

Megan changes the price of one tablet from £389 to £330.98

(a) Has Megan changed the price correctly?

(b) Use estimation to show a check of your answer.
A team of workers deliver identical fridges.

The team will use the average time to fully load an old lorry to predict the time to fully load a new lorry.

The table shows the times it took to fully load the old lorry with 24 fridges.

<table>
<thead>
<tr>
<th>Time (mins)</th>
<th>52</th>
<th>60</th>
<th>55</th>
<th>59</th>
<th>54</th>
<th>63</th>
<th>56</th>
</tr>
</thead>
</table>

The diagram shows the space available for fridges in the new lorry. The space is in the shape of a cuboid.

Each fridge needs a rectangular floor space 1000 mm by 800 mm.

The team do not stack fridges.

They think it will take less than 90 minutes to fully load the new lorry.

Are they correct?
A team of workers deliver identical fridges. The team will use the average time to fully load an old lorry to predict the time to fully load a new lorry.

The table shows the times it took to fully load the old lorry with 24 fridges.

<table>
<thead>
<tr>
<th>Time (mins)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td></td>
</tr>
<tr>
<td>54</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

The diagram shows the space available for fridges in the new lorry. The space is in the shape of a cuboid.

13600 mm
2400 mm

Each fridge needs a rectangular floor space 1000 mm by 800 mm. The team do not stack fridges.

They think it will take less than 90 minutes to fully load the new lorry.

Are they correct?

(Total for Question 8 is 6 marks)
Louis makes a cake.
The cake is in the shape of a cylinder with diameter 14 inches.

Louis needs to put a ribbon around this cake.
The ribbon will go around the cake once with a 6 inch overlap.

Louis has a piece of ribbon 48 inches in length.

Is this piece of ribbon long enough for this cake?

(Total for Question 9 is 3 marks)
10 The scatter diagram shows some information about 12 athletes who have run a race.

Here is the information for another athlete

- age 36, time 29 minutes.

(a) Plot this information on the scatter diagram. (1)

(b) Draw the line of best fit on the scatter diagram. (1)

(c) Describe the relationship shown in this scatter diagram. (1)

(Total for Question 10 is 3 marks)
11 George will cover part of a floor with tiles. 
The part of the floor is in the shape of a triangle as shown.

![Diagram of a triangle with sides 305 cm and 371.5 cm]

George buys tiles in packs. 
Each pack covers 1 m\(^2\) and costs £39.95

The tiles can be cut and joined. 
George gets \(\frac{1}{3}\) off the cost of the packs of tiles.

Work out the lowest cost of the tiles for George. (5)
George will cover part of a floor with tiles. The part of the floor is in the shape of a triangle as shown.

305 cm
371.5 cm

George buys tiles in packs. Each pack covers 1 m² and costs £39.95. The tiles can be cut and joined. George gets 1/3 off the cost of the packs of tiles.

Work out the lowest cost of the tiles for George.

£

(Total for Question 11 is 5 marks)
12 Gabi wants to buy a flat.
The cost of the flat is £175 000

The bank uses this formula to work out the mortgage Gabi can get.

\[
M = 4.625A
\]

- \(M\) = mortgage (£)
- \(A\) = annual income (£)

Gabi has an annual income of £34 000
She will have to pay a deposit for the flat.
The deposit is the difference between the cost of the flat and the mortgage.

(a) Work out the deposit Gabi will have to pay.

\[£\]

(b) Gabi invests £4000 for 3 years.
The investment earns 2% compound interest per annum.

Work out the value of the investment at the end of 3 years.

\[£\]

(Total for Question 12 is 6 marks)

TOTAL FOR SECTION B = 48 MARKS
Gabi wants to buy a flat.
The cost of the flat is £175 000
The bank uses this formula to work out the mortgage Gabi can get.

\[ M = 4.625A \]

\( M = \text{mortgage (£)} \)
\( A = \text{annual income (£)} \)

Gabi has an annual income of £34 000
She will have to pay a deposit for the flat.
The deposit is the difference between the cost of the flat and the mortgage.

(a) Work out the deposit Gabi will have to pay.

(b) Work out the value of the investment at the end of 3 years.

\( \text{(3)} \)

£

(Total for Question 12 is 6 marks)

TOTAL FOR SECTION B = 48 MARKS
TOTAL FOR PAPER = 64 MARKS
**Q1 (a)**

**Process to find the median**

- e.g. \((-2 + -9) ÷ 2\)
  
  \((-5.5)\)

**Mark**

1

**Ref**

A

**Evidence**

- Writes a comparative statement
  
  e.g. \(−5.5\)

**Q1 (b)**

**Valid check for the median**

- e.g. \('−5.5' × 2 = −11\)
  
  \(-2 + -9 = −11\)

**Total marks for question**

3
## Level 2 - Section B: Mark Scheme

<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1(a)</td>
<td>Process to find the median</td>
<td>1 or</td>
<td>A</td>
<td>e.g. ((-2 + -9) ÷ 2 = -5.5)</td>
</tr>
<tr>
<td></td>
<td>Writes a comparative statement</td>
<td>2</td>
<td>AB</td>
<td>e.g. (-5.5) <strong>and</strong> the median value for set B is smaller than set A.</td>
</tr>
<tr>
<td>Q1(b)</td>
<td>Valid check for the median</td>
<td>1</td>
<td>C</td>
<td>e.g. (\text{‘-5.5’} \times 2 = -11) <strong>and</strong> (-2 + -9 = -11)</td>
</tr>
</tbody>
</table>

**Total marks for question**: 3
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2(a)</td>
<td>Completes sample space table</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>Q2(b)</td>
<td>Accurate figure</td>
<td>1</td>
<td>B (correct cells in the table, see solution below)</td>
</tr>
<tr>
<td>Q2(c)</td>
<td>Accurate figure</td>
<td>1</td>
<td>C (see solution for Q2b)</td>
</tr>
</tbody>
</table>

**Correct answer for Q2a**

\[
\begin{array}{cccccc}
+ & 1 & -2 & 3 & -4 & 5 \\
-1 & 0 & -3 & 2 & -5 & -7 \\
2 & 3 & 0 & 5 & -2 & 7 \\
-3 & 2 & -5 & 0 & -7 & 2 \\
4 & 5 & -4 & 2 & 9 & 6 \\
-5 & -4 & -2 & -9 & 0 & 11 \\
6 & 7 & 4 & 2 & 9 & 11 \\
\end{array}
\]
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q3</td>
<td>Begins the process to work with income</td>
<td>1 or</td>
<td>A</td>
<td>e.g. 2600 × 12 (=31200) <strong>or</strong> 80 × 39 (=3120) <strong>OR</strong> 2600 × 12 ÷ 52 (=600) <strong>or</strong> 80 × 39 ÷ 52 (=60)</td>
</tr>
<tr>
<td></td>
<td>Process to find total annual or monthly or weekly income for both jobs</td>
<td>2</td>
<td>AB</td>
<td>e.g. 2600 × 12 + 80 × 39 (=34320) <strong>OR</strong> ‘3120’ ÷ 12 + 2600 (=2860) <strong>OR</strong> 2600 × 12 ÷ 52 + 80 × 39 ÷ 52 (=660)</td>
</tr>
<tr>
<td></td>
<td>A process to form an appropriate fraction</td>
<td>1 or</td>
<td>C</td>
<td>e.g. ‘3120’ <strong>or</strong> ‘260’ <strong>or</strong> ‘60’ <strong>or</strong> ‘3120’ $$\div$$ 12 + 2600 $$\div$$ 52 (=2860) <strong>OR</strong> 2600 $$\div$$ 12 + 80 $$\div$$ 39 (=52) <strong>OR</strong> Accept {total} to be the total of all income or the total of the office income annually or monthly or weekly</td>
</tr>
<tr>
<td></td>
<td>Accurate figure (given as fraction in its simplest form)</td>
<td>2</td>
<td>CD</td>
<td>$$\frac{1}{11}$$</td>
</tr>
</tbody>
</table>

**Total marks for question** 4
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q4</td>
<td>Begins to draw front elevation</td>
<td>1 or</td>
<td>A</td>
<td>A rectangle 6 sq lengths by 5 sq lengths OR 2 of: 15 ÷ 3 (=5), 10.5 ÷ 3 (=3.5), 4.5 ÷ 3 (=1.5), 18 ÷ 3 (=6), 7.5 ÷ 3 (=2.5) OR Pentagon with at least 2 correct sides: 5, 3.5, 4.3, 1.5, 6 sq lengths and 2 right angles at the base OR Similar pentagon in incorrect scale</td>
</tr>
<tr>
<td></td>
<td>Improves front elevation</td>
<td>2 or</td>
<td>AB</td>
<td>Pentagon with at least 3 correct sides: 5, 3.5, 4.3, 1.5, 6 sq lengths and 3 right angles OR Fully correct pentagon in incorrect orientation</td>
</tr>
<tr>
<td></td>
<td>Correct front elevation</td>
<td>3</td>
<td>ABC</td>
<td>Pentagon with all correct sides: 5, 3.5, 4.3, 1.5, 6 sq lengths and 3 right angles in correct orientation</td>
</tr>
</tbody>
</table>

**Total marks for question** 3

Example of a fully correct answer

![Example Diagram](image-url)
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
</table>
| Q5       | Fully correct route | 1    | A        | Route starts and ends at E and covers the total distance of between 15 and 20 km (between 9 and 12 miles) and goes through point C at least once  
  e.g. E, D, C, A, F, E  
  Can include going through the same point twice  
  May be implied by subsequent calculations |
|          | Converts between miles and km | 1    | B        | e.g. 15 × 0.6 (=9) or 20 × 0.6 (=12) or 0.25 ÷ 0.6 (=0.41..) or  
  ‘10’ ÷ 0.6 (=16.66..) |
|          | Process to find total distance for their route | 1 or | C        | e.g. 1.75 + 2.25 + 5.5 + 0.25 + 0.25 (=10) oe  
  Must start and end at E and go through at least two other points |
|          | Accurate distance figure for their route | 2    | CD       | e.g. 10 or 16.66.. truncated or rounded to 1 d.p. or better |
|          | Distance for their route with stated units | 1    | E        | e.g. 10 miles or 16.6.. km  
  Award this mark for correct units stated even if figure for their distance is inaccurate |

**Total marks for question 5**
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q6</td>
<td>Process to find area of one face</td>
<td>1 or</td>
<td>A</td>
<td>2.5² (=6.25)</td>
</tr>
<tr>
<td></td>
<td>Full process to find surface area of the cube</td>
<td>2 or</td>
<td>AB</td>
<td>6 × 2.5² (=37.5)</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td>3</td>
<td>ABC</td>
<td>37.5</td>
</tr>
</tbody>
</table>

Total marks for question 3
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q7(a)</td>
<td>Begins to work with percentage</td>
<td>1 or</td>
<td>A</td>
<td>$0.18 \times 389 = 70.02$ oe OR $1 - 0.18 = 0.82$ OR $330.98 \div 389 = 0.85..$</td>
</tr>
<tr>
<td></td>
<td>Full process to find figures to compare</td>
<td>2 or</td>
<td>AB</td>
<td>‘$0.82 \times 389 = 318.98$’ oe OR $330.98 \div 0.82 = 403.63..$ oe OR $1 - 0.18 = 0.82$ and $330.98 \div 389 = 0.85..$ OR $0.18 \times 389 = 70.02$ and $389 - 330.98 = 58.02$</td>
</tr>
<tr>
<td></td>
<td>Valid decision with accurate figures</td>
<td>3</td>
<td>ABC</td>
<td>e.g. No AND (£)318(.98) (correct new price) OR No AND (£)403(.63..) (original price) OR No AND 82(%) and 85(0..%) oe OR No AND (£)70(.02) and (£)58(.02)</td>
</tr>
<tr>
<td>Q7(b)</td>
<td>Valid estimation check</td>
<td>1</td>
<td>D</td>
<td>e.g. $20 \div 100 \times 400 = 80$ is close to 70.02 or $80 \div 100 \times 400 = 320$ is close to 318.98 or $80 \div 100 \times 390 = 312$ is too far from 330.98</td>
</tr>
</tbody>
</table>

Total marks for question: 4
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q8</td>
<td>Process to work with average</td>
<td>1</td>
<td>A</td>
<td>e.g. 56 identified (median) OR (52 + 60 + 55 + 59 + 54 + 63 + 56) ÷ 7 (=57)</td>
</tr>
<tr>
<td></td>
<td>Begins to work with dimensions</td>
<td>1 or</td>
<td>B</td>
<td>13600 ÷ 1000(=13.6) or 2400 ÷ 800(=3) OR 13600 ÷ 800(=17) or 2400 ÷ 1000(=2.4)</td>
</tr>
<tr>
<td></td>
<td>Full process to find the number of fridges</td>
<td>2</td>
<td>BC</td>
<td>‘13’ × ‘3’ (=39) OR ‘17’ × ‘2’ (=34)</td>
</tr>
<tr>
<td></td>
<td>Begins to work with load times</td>
<td>1 or</td>
<td>D</td>
<td>e.g. ‘56 ÷ 24 (=2.33..) or ‘57 ÷ 24 (=2.375)</td>
</tr>
<tr>
<td></td>
<td>Full process to find figures to compare</td>
<td>2 or</td>
<td>DE</td>
<td>e.g. ‘39 ÷ 2.33..’ (=91) oe OR ‘39 ÷ 2.375 (=92.625) OR 90 ÷ ‘39’ (=2.307..) OR Allow use of ‘34’ for ‘39’</td>
</tr>
<tr>
<td></td>
<td>Valid decision with accurate figures from</td>
<td>3</td>
<td>DEF</td>
<td>e.g. No AND 91 (mins) OR No AND 92(.625) (mins) OR No AND 2.30(7..) and 2.33(3..) (min per fridge)</td>
</tr>
<tr>
<td></td>
<td>their correct working</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total marks for question** 6
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q9</td>
<td>Begins to work with perimeter</td>
<td>1 or</td>
<td>A</td>
<td>$\pi \times 14 ; (=43.9..) ; \text{ OR } ; 48 - 6 ; (=42)$ Allow use of 3.14 or better for $\pi$</td>
</tr>
<tr>
<td></td>
<td>Full process to find figures to compare</td>
<td>2 or</td>
<td>AB</td>
<td>‘43.9..’ + 6 ; (=49.9..) ; \text{ OR } ; \pi \times 14 ; (=43.9..) ; \text{ and } ; 48 - 6 ; (=42) ; \text{ OR } ; 48 - ‘43.9..’ ; (=4.01..)</td>
</tr>
<tr>
<td></td>
<td>Valid decision with accurate figures</td>
<td>3</td>
<td>ABC</td>
<td>No AND 49(.9..) ; (inches) ; \text{ OR } ; No AND 43(.9..) ; \text{ and } ; 42 ; (inches) ; \text{ OR } ; No AND 4(.01..) ; (inches ; for ; the ; overlap)</td>
</tr>
</tbody>
</table>

**Total marks for question**: 3
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q10(a)</td>
<td>Correct plotting</td>
<td>1</td>
<td>A</td>
<td>Plots point (36,29)</td>
</tr>
<tr>
<td>Q10(b)</td>
<td>Correct line of best fit</td>
<td>1</td>
<td>B</td>
<td>Line of best fit placed correctly see guidance boxes on diagram, line must go in or pass through them</td>
</tr>
<tr>
<td>Q10(c)</td>
<td>Correct description of correlation</td>
<td>1</td>
<td>C</td>
<td>e.g. positive correlation (between age and time) OR an explanation in context e.g. as you get older it takes you longer to run the race</td>
</tr>
</tbody>
</table>

**Total marks for question**: 3

Example of correct answer

![Scatter plot with trend line](image.png)
<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Ref</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q11</td>
<td>Uses consistent units</td>
<td>1</td>
<td>A</td>
<td>e.g. 3.05(m) and 3.715(m) or 10000(cm²) May be seen or implied by subsequent working</td>
</tr>
<tr>
<td></td>
<td>Process to find area</td>
<td>1</td>
<td>B</td>
<td>‘3.05’ × ‘3.715’ ÷ 2 (=5.66..)</td>
</tr>
<tr>
<td></td>
<td>Process to work with whole packs</td>
<td>1</td>
<td>C</td>
<td>‘6’ × 39.95 (=239.7) OR ‘26.63..’ × ‘6’ (=159.8) OR ‘6’ ÷ 3 × 2 (=4) oe</td>
</tr>
<tr>
<td></td>
<td>Process to work with fractional discount</td>
<td>1</td>
<td>D</td>
<td>‘239.7’ ÷ 3 × 2 (=159.8) oe OR 39.95 ÷ 3 × 2 (=26.63..) oe OR 39.95 × ‘4’ (=159.8)</td>
</tr>
<tr>
<td></td>
<td>Correct answer</td>
<td>1</td>
<td>E</td>
<td>159.80</td>
</tr>
<tr>
<td><strong>Total marks for question</strong></td>
<td></td>
<td><strong>5</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Process</td>
<td>Mark</td>
<td>Mark Ref</td>
<td>Evidence</td>
</tr>
<tr>
<td>----------</td>
<td>---------</td>
<td>------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td><strong>Q12(a)</strong></td>
<td>Works with formula</td>
<td>1 or</td>
<td>A</td>
<td>$4.625 \times 34\ 000 (= 157\ 250)$</td>
</tr>
<tr>
<td></td>
<td>Full process to find the amount of deposit</td>
<td>2 or</td>
<td>AB</td>
<td>$175\ 000 – ‘157\ 250’ (=17\ 750)$</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td>3</td>
<td>ABC</td>
<td>17\ 750</td>
</tr>
<tr>
<td><strong>Q12(b)</strong></td>
<td>Begins to work with compound interest</td>
<td>1 or</td>
<td>D</td>
<td>$(100 + 2) \div 100 (=1.02)\ oe$</td>
</tr>
<tr>
<td></td>
<td>Full process to find the total amount</td>
<td>2 or</td>
<td>DE</td>
<td>e.g. ‘4000’ $\times (1 + ‘0.02’)^3 (= 4244.832)\ oe$</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td>3</td>
<td>DEF</td>
<td>4244.83(2) or 4244.84</td>
</tr>
</tbody>
</table>

**Total marks for question 6**