Exemplar Student answers with examiner comments

About this booklet

This booklet has been produced to support mathematics teachers delivering the new Functional Skills Mathematics specification (first assessment summer 2019).

The booklet looks at questions from the Retired Set 6 which is available on the web as a practice paper. It shows real student responses to these questions, and how the examining team follow the mark schemes to demonstrate how the students would be awarded marks on these questions.

How to use this booklet

Our examining team have selected a student on the pass mark. Following each question, you will find the mark scheme for that question and then the student response with accompanying examiner comments on how the mark scheme has been applied and the marks awarded, and on common errors for this sort of question.
SECTION A

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

1. Jai needs to buy 25 lollipops for a party. He sees this offer.

   Lollipops selection bag
   now 3/5 extra free

Jai knows a normal selection bag contains 18 lollipops. He thinks he will have enough lollipops if he buys a selection bag with this offer.

Is Jai correct? Show why you think this.

\[
18 \div 3 = 6
\]

\[
6 + 18 = 24
\]

\[
1 \text{ bag } + \frac{3}{5} = 24
\]

No, he will not have enough lollipops.

24 lollipops.

(Total for Question 1 is 3 marks)
### Examsn comments

1. **3 marks**

A fractional increase question. The learner finds $1/3$ of $18$ and adds this on accurately. All the marks can be awarded. Learners should be encouraged to calculate with fractions and not try to convert to a decimal equivalent. This often leads to $1/3=0.3$ and then an incorrect answer.
Here is a formula

\[ d = \frac{180(n - 2)}{n} \]

Find the value of \( d \) when \( n = 5 \)

\[ d = \frac{180(5 - 2)}{5} \]
\[ d = \frac{180 \times 3}{5} \]
\[ d = \frac{180}{5} \times 3 \]
\[ d = \frac{360}{5} \]
\[ d = 72 \]

\[ d = 18 \]

(Total for Question 2 is 3 marks)
Examiner comments

2. 2 marks

The substitution is correct. The only error here is the inability to divide 540 by 5 accurately. An answer of 18 is given. This cannot be right, if we have more than 500 to begin with, we know when we divide by 5 the answer should be greater than 100. Learners should sense check answers to calculations as they go.
3 Andrew is a member of a walking club.
He sees this sign next to a footpath.

Andrew will walk from this sign along the footpath to Glossop to meet his friend. They will then both walk back along the footpath to the sign and then onto New Mills.

Work out the total distance that Andrew walks.
Give your answer as a mixed number. You must show your working.

\[
4 \frac{3}{8} \Rightarrow 5 \frac{1}{2}
\]

\[
5 - 4 = 1 \text{ mile}
\]

\[
\frac{1}{2} - \frac{3}{8}
\]

Total for Question 3 is 4 marks
### Examiner comments

3. 0 marks

Instead of adding the distances this learner tries to subtract but at no point do they engage with converting the fraction to a common denominator. Hence no marks can be awarded.
4. A box contains bags of crisps. Each bag of crisps is either beef flavour, prawn flavour or cheese flavour. Beth is going to take at random a bag of crisps from the box. The table shows each of the probabilities that the flavour will be beef or will be cheese.

<table>
<thead>
<tr>
<th>flavour</th>
<th>beef</th>
<th>prawn</th>
<th>cheese</th>
</tr>
</thead>
<tbody>
<tr>
<td>probability</td>
<td>0.4</td>
<td>0.12</td>
<td>0.35</td>
</tr>
</tbody>
</table>

(a) Work out the probability that Beth takes a bag of prawn flavour crisps.

\[
\frac{0.12}{4}
\]
200 workers are asked about the favourite drink they have at work. Some of the results are shown in the table below.

(b) Complete the two-way table.

<table>
<thead>
<tr>
<th></th>
<th>water</th>
<th>tea</th>
<th>coffee</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>office</td>
<td>17</td>
<td>63</td>
<td>8</td>
<td>88</td>
</tr>
<tr>
<td>warehouse</td>
<td>10</td>
<td>64</td>
<td>38</td>
<td>112</td>
</tr>
<tr>
<td>total</td>
<td>27</td>
<td>27</td>
<td>46</td>
<td>200</td>
</tr>
</tbody>
</table>

(c) What is the probability that a worker choosing coffee works in the office? Give your answer as a fraction in its simplest form.

\[ \frac{8}{88} = \frac{1}{11} \]
### Examiner comments

**4a. 0 marks**

There is no clear method shown and the answer although not totally clear is not 0.25 No marks can be awarded.

**4b. 1 mark**

27 is given instead of 127, in this case a little more care/concentration may have led to the correct answer. This is probably an arithmetic error.

**4c. 1 mark**

The learner correctly selects and uses 8. However, they should have used 46 not 88. So just one mark can be given.
SECTION B

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

1 Olivia plans to drive from Birmingham to Manchester non-stop.
The distance is 87 miles.
She has allowed 1.5 hours for the journey.

(a) What is the average speed she must drive to complete the journey in
1.5 hours?

\[
\frac{87}{1.5} = 58
\]

\(58 \text{ mph}\)

(b) Use a reverse calculation to show a check of your answer.

\[58 \times 1.5 = 87\]

(Total for Question 1 is 3 marks)
1a. 2 marks

A fully correct answer testing knowledge of speed, distance and time.

1b. 1 mark

A clear reverse calculation is shown for the check.
2. Brian is a sports reporter. Team A played 30 rugby matches. The table shows information about the number of tries team A scored in these matches.

<table>
<thead>
<tr>
<th>number of tries</th>
<th>number of matches</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>total</td>
<td>30</td>
</tr>
</tbody>
</table>

(a) Work out the mean number of tries team A scored per match.

(b) Which team is more consistent scoring tries? Explain why you think this.

Team A with range of 3 tries. Less score.

(Total for Question 2 is 3 marks)
Examiner comments

2a. 2 marks

The table is used to show the products required as working. The last step to find the mean is not shown but the answer is correct so this step can be implied. Both marks can be awarded.

2b. 1 mark

A correct statement to compare the ranges and as such compare consistency is seen.
3 The head teacher at a school is organising for some year 7 and some year 8 pupils to go on a school trip. 72 people in total will go on the school trip.

There will be 1 adult to every 5 pupils.

The ratio of the number of year 7 pupils to the number of year 8 pupils will be 3 : 1

How many adults, year 7 pupils and year 8 pupils will go on the trip?

\[
72 \div 5 : 72 \div 4 = 18
\]

\[
18 \times 3 = 54
\]

\[
72 \div 5 = 14.4
\]

15 adults

54 year 7 pupils

18 year 8 pupils

(Total for Question 3 is 4 marks)
Examiner comments

3.0 marks

This learner does not engage with the 1 adult to 5 pupils’ part of the question and so cannot receive any marks.
4 Josh drives a lorry. He is planning his route.

On the planned route there is a low bridge. The maximum height of a lorry allowed under the bridge is 14 feet.

Josh knows the lorry is 4.2 m high.

Josh uses 1 foot = 0.3048 m.

(a) Will the lorry be allowed under the bridge? Show why you think this.

4.2 m high

\[
14 \times 0.3048 = 4.2672
\]

Yes

(b) Use a reverse calculation to show a check of your answer.

\[
4.2672 \div 14 = 0.3048
\]

(Total for Question 4 is 3 marks)
Examiner comments

4a. 2 marks

A correct conversion is given. The answer is accurate, and the decision given.

4b. 1 mark

An accurate reverse calculation, with answer, is given.
Yasmine invests £4000
For the first 2 years she receives annual compound interest of 3%
In year three she receives annual compound interest of 2.5%
At the end of year three Yasmine wants to buy a car for £4500
She will use all of the investment and interest towards the cost of the car.

Work out how much more money Yasmine needs to buy the car.
You must show your working

\[
\begin{align*}
4000 & \text{ for 2 years} \\
1.03^2 \times 4000 & = 4,243.60 \\
4000 & \text{ for third year} \\
2.5 \times 4000 & = 100 \\
\frac{100}{100} & \times 4000 = 4,143.60 \\
\end{align*}
\]

£ 4,343.60

(Total for Question 5 is 5 marks)
Examiner comments

5. 2 marks

Marks A and B can be awarded for the first line here. It is a full process to work with compound interest for 2 years. The learner then uses 2.5% with 4000 and does not use a compound method, hence no more marks can be awarded. The distinction between simple and compound interest is a level 1/level 2 discriminator.
6

(a) Write down the coordinates of point A.

\[ (-4, -2) \]

(b) Mark with a cross the point C on the grid so that angle ACB is a right angle.

(c) Write down the sum of the interior angles of a triangle.

\[ 180^\circ \]

(Total for Question 6 is 3 marks)
Examiner comments

6a. 1 mark
Correct coordinates given.

6b. 1 mark
The letter C is within tolerance of the required point. The use of 'x' when plotting points is better and should be encouraged.

6c. 1 mark
Correct answer stated.
7 Carlos records the number of tweets his company posts every year on social media.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>tweets</td>
<td>452</td>
<td>325</td>
<td>744</td>
<td>1022</td>
<td>712</td>
<td>750</td>
</tr>
</tbody>
</table>

(a) Find the median number of tweets.

\[
\begin{align*}
325, & 452, 712, 744, 750, 1022 \\
\frac{712 + 744}{2} &= 728
\end{align*}
\]

In 2019, 6% of the tweets were about job vacancies.

(b) How many of the tweets in 2019 were about job vacancies?

\[
\frac{750 \times 6}{100} = 45
\]

(Total for Question 7 is 4 marks)
## Examiner comments

**7a. 2 marks**

The median is found accurately with working shown.

**7b. 2 marks**

750 is extracted from the table and the calculation to find 6% of this value is performed accurately. Both marks can be awarded.

<table>
<thead>
<tr>
<th>Question</th>
<th>Process</th>
<th>Mark</th>
<th>Mark Grid</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q7(a)</td>
<td>Full process to find the median</td>
<td>1 or 2</td>
<td>A AB</td>
<td>(712 + 744) ÷ 2 (~728) 728</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q7(b)</td>
<td>Full process to find 6%</td>
<td>1 or 2</td>
<td>C CD</td>
<td>e.g. '750' ÷ 6 + 100 (~45) 45</td>
</tr>
<tr>
<td></td>
<td>Accurate figure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
8 Myra works as a volunteer at her local pony club. She is going to cover the front of the stables with paint.

The diagram shows a sketch of the front of the stables.

Myra will buy the paint she needs.
1 tin of paint
- covers $7 \text{ m}^2$
- costs £6.45

She uses this rule.
Area in square feet $\div 10.764 = $area in square metres.

Work out the total cost of the tins of paint Myra will buy

\[
\begin{align*}
28 \times 5 &= \frac{140}{2} = 70 \\
7 \times 4 &= 280 \\
280 \div 7 &= 40 \text{ paints} \\
40 \times 6.45 &= 258.00
\end{align*}
\]

£ 258.00

(Total for Question 8 is 6 marks)
Examiner comments

8. 1 mark

The first calculation $28 \times 5$ is 'beginning to work with area', so the A mark can be awarded. The learner then does not calculate the area correctly. There is a need for learners to know how to work out the area of a triangle without being given a formula. There is no attempt to use the given rule. The division by 7 is not on a metric area and so is not worthy of any marks. On the mark scheme the use of $3 \times 6.45$ means that the 3 must come from a correct process. 40 is used here instead of 3 and is not from a correct process so no more marks can be awarded.
9 Leona works in a sock shop.
The scatter diagram shows the number of pairs of thermal socks sold and the average temperature that month.

Sales of thermal socks

<table>
<thead>
<tr>
<th>Number of pairs sold</th>
<th>Average temperature °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>0</td>
</tr>
<tr>
<td>60</td>
<td>2</td>
</tr>
<tr>
<td>50</td>
<td>4</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
</tr>
<tr>
<td>30</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

(a) Draw a line of best fit onto the scatter diagram. 

(b) Describe the correlation between the number of pairs of thermal socks sold and the temperature.

Negative Correlation

Next month the predicted average temperature is 5°C. Leona needs to estimate how many pairs of thermal socks she will sell.

(c) Estimate the number of pairs of thermal socks she will sell next month.

28 Socks

(Total for Question 9 is 3 marks)
Examiner comments

9a. 1 mark

This line is within the tolerance allowed.

9b. 1 mark

Negative is enough for this mark as it describes the correlation.

9c. 0 marks

28 is not correct, it is too low.
10 Chris has moved to a new flat. The grid shows a plan of the kitchen.

Key
- walls
- cupboards

1 square length on the grid represents 0.3 m in the kitchen

Chris needs to put a fridge and a table in the kitchen. The fridge will need a rectangular space 90 cm by 60 cm with the longest side against a wall but not against a window.

The table will need a rectangular space 60 cm by 75 cm and to be at least 60 cm away from the doorways, the cupboards, the fridge and not against a wall.

Draw the space for the fridge and the space for the table on the grid for Chris. Remember to label the items.

(Total for Question 10 is 3 marks)
Examiner comments

10. 0 marks

No attempt at this question is seen. The use of scale drawings is often set and practice at drawing different lengths using scale may help learners develop the skills required for this type of question.
11 Nigel is the secretary of a football club. He pays three match officials each week.
He has this information for the payments he made for the last 5 weeks.

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>62.94</td>
<td>47.12</td>
<td>92.37</td>
<td>74.80</td>
<td>81.45</td>
</tr>
</tbody>
</table>

The table shows the match fees and expenses the officials will receive in week 6.

<table>
<thead>
<tr>
<th>official</th>
<th>fee</th>
<th>expenses</th>
</tr>
</thead>
<tbody>
<tr>
<td>referee</td>
<td>£36</td>
<td>46 miles at 30p per mile</td>
</tr>
<tr>
<td>assistant 1</td>
<td>£27</td>
<td>14 miles at 30p per mile</td>
</tr>
<tr>
<td>assistant 2</td>
<td>£27</td>
<td>23 miles at 30p per mile</td>
</tr>
</tbody>
</table>

The total payment for each official is made up of a match fee and expenses. Nigel pays 67% of the total payments for these three match officials.

Nigel thinks the payment he makes in week 6 is more than the median payment he made for the previous 5 weeks.

Is Nigel correct?
Show why you think this.

median for 5 weeks

47.12, 62.94, 74.80, 81.45, 92.37

median = 74.80

36 + 1580 = 1616
4.20 = 4.20
27 + 6.90 = 33.90
27 + 114.90

Total = 114.90
Yes he is correct!

£14.90

(Total for Question 11 is 5 marks)
Examiner comments

11. 3 marks

This is the three linked question. We are required to set (at least) one question on each level 2 paper that uses all the three areas of the specification. This is usually a 5 or 6 mark question.

Mark A is awarded for the median.

Marks B and C are awarded for working with all the officials and their total fees.

There is no attempt to work with the 67% given in the question and so no more marks can be awarded.
Tammy wants to make chocolate sweets.

The sweets will be solid chocolate in the shape of a sphere. Each sweet will have a radius of 2 cm.

Tammy will melt chocolate blocks to make the sweets. Each chocolate block is a cuboid 19 cm by 14 cm by 0.75 cm.

She has this formula

\[
\text{Volume of a sphere} = \frac{4}{3} \pi r^3
\]
where \( r \) = radius
\[
\pi = 3.14
\]

Tammy wants to make 45 sweets.
She thinks 7 blocks of chocolate are enough to make 45 sweets.

Is Tammy correct?
Show why you think this.

\[
\text{Radius} = 2\text{cm}
\]

\[
\text{Chocolate cuboid} = 19 \times 14 \times 0.75
= 199.5
\]

\[
\text{Volume of a sphere} = \frac{4}{3} \pi r^3
\]
\[
r^3 = 2^3 = 8
\]
\[
2 \times 8 = 16
\]
\[
\frac{4}{3} \times 25.136 = 33.5 \approx 33.5 \times 15
\]
\[
199.5 \times 7 = 1396.5
\]
\[
1396.5 \div 7 = 199.5
\]
No, Tommy can only make 31 sweets.
## Examiner comments

12. 6 marks

The volume of the cuboid is calculated first. This allows the C mark to be awarded. The formula is then used in stages and all the stages together are a full process so marks A and B can be awarded.

The volume of the cuboid is then used with 7 and 45 to work out how much chocolate is available per sphere. There are now two figures which can be compared. Accuracy to 33 and 31 is the requirement here. The decision is given on the next page as no.

The sentence after is not quite the correct interpretation but as this is not a requirement of the question it has been condoned.

It is also worth noting that 199.5 × 7 is 1396.5 and the figure written is 1.396.5, we do often see a decimal point used instead of a comma and as long as this is consistent and non-contradictory we accept this notation.

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Total marks learner has achieved for the whole paper is **37 marks**. The threshold pass mark for this retired set was **36 marks**.

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