Queensland Government | QCAA Queensland Curriculum & Assessment Authority

Queensland Curriculum and Assessment Authority

Essential Mathematics 2025 v1.2

IA4: Sample marking scheme

This sample has been compiled by the QCAA to assist and support teachers in planning and developing assessment instruments for individual school settings.

Short response (40 marks)

Assessment objectives

This assessment technique is used to determine student achievement in the following objectives:

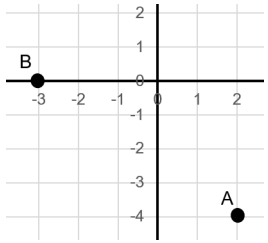
1. recall mathematical knowledge
2. use mathematical knowledge
3. communicate mathematical knowledge
4. evaluate the reasonableness of solutions
5. justify procedures and decisions
6. solve mathematical problems.

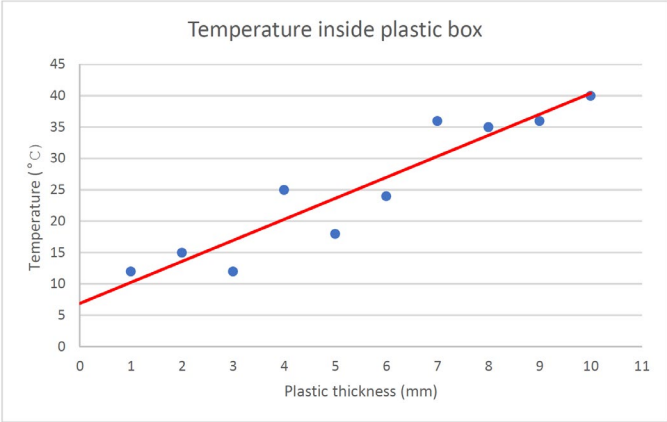
Purpose

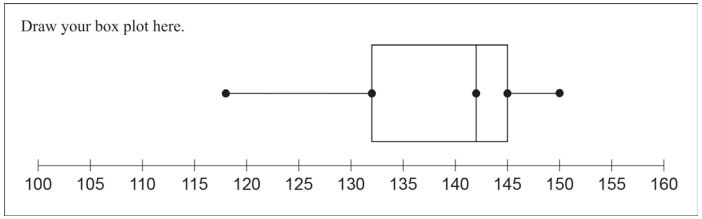
The scheme provides:

- explicit statements about what is expected of students when they respond to a question
- sample responses that identify characteristics to assist the marker to make judgments
- where relevant, notes that provide further information to assist the marker in making a decision
- a tool for calibrating markers to ensure comparability of results.

Marking scheme

<table>
<tr><th>Q</th><th>Sample response</th><th>The response:</th><th>Notes</th></tr>
<tr><td>1a)</td><td>C (5, 4)</td><td>• correctly writes down coordinates
[1 mark]</td><td>Accept alternative format, e.g. $x = 5$, $y = 4$, coordinates written on Cartesian plane.</td></tr>
<tr><td>1b)</td><td> 
</td><td>• correctly plots coordinates for Adam (A)
[1 mark]
• correctly plots coordinates for Ben (B)
[1 mark]</td><td></td></tr>
<tr><td>2</td><td><table>
<tr><td>total distance, D (km)</td><td>0</td><td>1</td><td>2</td><td>5</td><td>10</td></tr>
<tr><td>total fare, C ($)</td><td>4</td><td>6</td><td>8</td><td>14</td><td>24</td></tr>
</table></td><td>• correctly calculates total fare for 0 km
[1 mark]
• correctly calculates total fare for 5 km
[1 mark]
• correctly calculates total fare for 10 km
[1 mark]</td><td></td></tr>
<tr><td>3)</td><td>Positive
Linear
Moderate.</td><td>• correctly describes direction [1 mark]
• correctly describes form [1 mark]
• correctly describes strength [1 mark]</td><td>Only accept if appropriate terms are used to describe direction, form and strength.</td></tr>
</table>

Q	Sample response	The response:	Notes
4a)	Temperature is dependent. Plastic thickness is independent.	• correctly identifies dependent variable **[1 mark]** • correctly identifies independent variable **[1 mark]**	
4b)		• correctly draws appropriate line of best fit **[1 mark]**	
4c)	The thicker the plastic, the higher the temperature inside.	• correctly describes one feature of the scatterplot **[1 mark]**	Accept other relevant feature e.g. spread, possible outliers or variability, trend or data points.
5a)	The box plot is symmetrical around 110 c.	• correctly identifies box plot is symmetrical **[1 mark]**	Accept similar statement, e.g. box plot is evenly spread.

Q	Sample response	The response:	Notes
5b)		• correctly plots 5 values from the five-number summary using an appropriate scale **[1 mark]** • constructs box plot **[1 mark]**	Allow FT marks due to error/s in prior working. Accept appropriate variations, e.g. box plot drawn below line.
5c)	The box plot is negatively skewed.	• describes the spread of the box plot **[1 mark]**	Accept similar statements, e.g. bulk of box plot is between 1.6 m and 2.2 m; outlier of 3.0 m.
6a)	1, 1, 1, 1, 1, 1, 2, 2, 3, 3, 4, 4	• correctly lists the values from smallest to largest **[1 mark]**	
6b)	1.5	• identifies median **[1 mark]**	Allow FT mark due to error/s in prior working.
6c)	1	• correctly identifies mode **[1 mark]**	
6d)	$\text{Mean} = \frac{\Sigma x}{n}$ $= \frac{24}{12}$ $= 2$	• correctly applies relevant strategy **[1 mark]** • calculates mean **[1 mark]**	Accept other relevant strategy to determine mean, e.g. $\frac{223}{9}$ or statement about using calculator statistical facility Allow FT mark due to error/s in prior working.

Q	Sample response	The response:	Notes
6e)	$Q_1 = 1$	• correctly determines Q_1 **[1 mark]**	
6f)	$Q_3 = 3$	• correctly determines Q_3 **[1 mark]**	
7a)	$I = Pin$ $I = 500 \times 0.075 \times 5$ $I = \$187.50$	• correctly applies relevant strategy **[1 mark]** • calculates total interest **[1 mark]**	Accept other relevant strategy to determine interest after 5 years e.g. adding each year of interest. Allow FT marks due to error/s in prior working.
7b)	$A = P + I$ $A = 500 + 187.50$ $A = \$687.50$	• applies relevant strategy **[1 mark]** • determines most expensive dress **[1 mark]**	Accept other relevant strategy to determine total amount, e.g. 500 + 187.50
8a)	$A = P(1 + i)^n$ $A = \$15000(1 + 0.095)^6$ $A \approx \$25856.87$ $A = \$25857$	• correctly applies relevant strategy **[1 mark]** • determines the future value rounded to the nearest dollar **[1 mark]**	Accept other relevant strategy to determine total amount, e.g. recurrence relation. Allow FT marks due to error/s in prior working.

Q	Sample response	The response:	Notes
8b)	$I = A - P$ $I = 25857 - 15000$ $I = \$10857$	• applies relevant strategy **[1 mark]** • calculates total interest paid **[1 mark]**	Accept other relevant strategy to determine interest amount, e.g. working that shows link between future value and principal.
9a)	345 cm	• correctly determines height **[1 mark]**	Accept 340 to 350 cm inclusive.
9b)	6 minutes 30 seconds	• correctly determines length of time **[1 mark]**	Accept 6 min 20s to 6 min 40s inclusive. Accept alternative form e.g. 6.5 mins.
9c)	The prediction is reasonable. This is because the if the line of best fit is extended, it appears that when the time is 13 minutes, the height of water is 0 cm.	• evaluates reasonableness of prediction **[1 mark]** • provides mathematical reasoning **[1 mark]**	Allow FT marks due to error/s in prior working. This mark can only be awarded if some mathematical reasoning has been provided.

<table>
<tr><th>Q</th><th>Sample response</th><th>The response:</th><th>Notes</th></tr>
<tr>
<td>10</td>
<td>Find the median of each team and compare

Order the numbers for Team 1
25, 26, 28, 30, 32, 33, 34, 34, 35, 37, 38, 40
Median = 33.5

Order the numbers for Team 2
26, 28, 29, 31, 33, 34, 35, 38, 40, 42, 44, 45
Median = 34.5

The coach’s conclusion was reasonable.</td>
<td>• correctly determines summary statistic for Team 1 [1 mark]

• correctly determines summary statistic for Team 2 [1 mark]

• evaluates the reasonableness of the coach’s conclusion [1 mark]

• shows logical organisation, communicating key steps [1 mark]</td>
<td>Accept other relevant summary statistics e.g. mean.
<table><tr><td></td><td>Mean</td></tr><tr><td>Team 1</td><td>32.67</td></tr><tr><td>Team 2</td><td>35.42</td></tr></table>
Allow FT marks due to error/s in prior working.
This mark can only be awarded if some mathematical reasoning has been provided.

Key steps include appropriate mathematical vocabulary, symbols and conventions, e.g. connecting statements, use of equality signs.</td>
</tr>
</table>