These marking guidelines are prepared for use by examiners and sub-examiners, all of whom are required to attend a standardisation meeting to ensure that the guidelines are consistently interpreted and applied in the marking of candidates' scripts.

The IEB will not enter into any discussions or correspondence about any marking guidelines. It is acknowledged that there may be different views about some matters of emphasis or detail in the guidelines. It is also recognised that, without the benefit of attendance at a standardisation meeting, there may be different interpretations of the application of the marking guidelines.

Key:

- a accuracy
- ca continued accuracy
- m method
- ma method accuracy
- r rounding
- cap continued accuracy based on previous answer
### QUESTION 1

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1.1.1 \(34,7 - 0 \div 4\)

\[
34,7 - 0 = 34,7
\]

\[\text{OR}\]

\[
347 \div 10 = 34,7
\]

1.1.2 \(40\% \times 2\,050 \text{ g}\)

\[
40\% \times 2\,050 = 820 \text{ g}
\]

\[\text{OR}\]

\[
\frac{40}{100} \times 2\,050 = 820 \text{ g}
\]

1.1.3 \(\frac{2}{5} \times 1\,000\,000 = 400\,000\)

\[\text{OR}\]

\[
\frac{2}{5} \times 1 = 0,4 \text{ million}
\]

*If they multiplied by any power of ten, one ‘ca’ for answer.

1.1.4 \(60 \div 15 = 4\)

\[
P = 12 \div 4 = 3
\]

\[\text{OR}\]

\[
\frac{12}{60} = \frac{P}{15}
\]

\[
\frac{1}{5} = \frac{P}{15}
\]

\[
P = 3
\]

\[\text{OR}\]

\[
60P = 180
\]

\[
P = 3
\]

*If \(60 \div 12\)  

1.2.1 \(25 \div 60 = 0,4166666 \ldots\)  

\[
2\text{ hrs 25 min} \approx 2,42 \text{ hrs}
\]

Answer can be written as a mixed fraction: \(2\frac{5}{12}\) or \(29/12\)

If they just get 145 min: No marks

If 2,25: No marks

*Penalise 1 mark for incorrect rounding or not rounding to 2 dec.

*Look out for \(60 \div 25 = 2,4\) : No marks
### 1.2.2 Distance = Speed \times Time

Distance = 6,2 \text{ km/h} \times 2,42 \text{ h} \quad \text{(substitution of previous answer)}

Distance = 15,004 \text{ km} \quad \text{(Accept 15 km)}

*If incorrect substitution but answer correct \checkmark \checkmark \text{ OR}*

\[
\frac{25}{60} \times 6,2 \text{ km} \approx 2,583 \ldots \text{ km}
\]

6,2 km + 6,2 km + 2,583 km = 14,98 \text{ km} \quad (\approx 15 \text{ km})

6,2 \times 2 \checkmark = 12,4 \quad \text{(Mark given only if they have indicated that they rounded. OR)}

6,2 \times 2,4 = 14,88 \checkmark

6,2 \times 2,25 = 13,95 \checkmark \text{ ca if previous question NOT 2,25}

### 1.3

2 000 g ÷ 135 g \quad \text{(right order)} = 14,8 \approx 14 \text{ items} \quad \text{(down)}

\text{OR}

2 \text{ kg} ÷ 0,135 \text{ kg} \quad \text{ama} = 14,8 \approx 14 \text{ items} \quad \text{r}

\[
2 \checkmark \div 135 = 0,0148 \approx 0,01 \checkmark \text{ r}
\]

### 1.4.1

R5 000 ÷ R15,07 m

= £331,79 \quad \text{ama £330, £331, £331,80, £331,78}

Must be two decimals

### 1.4.2

£100 \times 1,16 m

= €116 a

If they ÷ no marks

### 1.5.1

125 \times 100^3 \quad \text{(for multiplying)}

\text{a for multiplying by 100^3 (or 1 000 000)}

= 125 000 000 \text{ cm}^3 \quad \text{a}

\text{OR}

5 \times 5 \times 5 = 500 \times 500 \times 500 \checkmark \text{ m} \checkmark \text{ a} = 125 000 000 \text{ cm}^3 \checkmark \text{ a}

*If they multiply by 100 and get an answer of 12 500 they get one mark only.*

*If they multiply by any power of ten, one mark.*

### 1.5.2

125 000 000 \text{ cm}^3 ÷ m 512 000 \text{ cm}^3 \checkmark \text{ ca (order i must be previous answer ÷ by 512000)}

= 244,14 \text{ ca}

\approx 244 \text{ ca(r)}

*If correct order but wrong values, can get ‘ca’ answer 2/3

\text{OR}
\[3\sqrt{125} = 500\]
\[3\sqrt{512\ 000} = 80\]
\[500 \div 80 = 6,25\]
\[6 \times 6 \times 6 = 216\]
*\[5 \times 120 \div 125 = 40,96\] ✓ ✓
*\[512\ 000 \div 12\ 500 = 40,96\] ✓ ✓
*\[12\ 500 \div 512\ 000 = 0,0244\ldots = 0\] boxes ✓ ✓ ✓
*If answer only = 0 boxes ✓ ✓ ✓

1.6
\[R\ 2\ 545 \times 105\% = R\ 2\ 672,25\] a
\[R\ 2\ 545 + R\ 2\ 672,25 = R\ 5\ 217,25\] ca
**OR**
\[R\ 2\ 545 \times 205\% = R\ 5\ 217,25\] ca

*Note: Students could multiply by a fraction or decimal in each case.*

1.7.1
\[\frac{1}{9}\] aa
OR 1 : 9 (9:1 ✓)
Just 9 = no marks
*0,1 = ✓

1.7.2
\[\frac{1}{8}\] a
\[= 0,125\] c a (or 0,13 or 0,1)
*If they only write 0,1 they get one mark
*If incorrect fraction converted correctly, one mark
*If just 8 then zero

1.8
\[15\ \text{km} \div 250\ 000\] m (for dividing)
\[= 0,000\ 06\ \text{km}\]
\[0,000\ 06\ \text{km} \times 100\ 000 = 1 : 250\ 000 = x : 1\ 500\ 000\] a
\[= 6\ \text{cm}\] ca
\[x = \frac{1\ 500\ 000}{250\ 000}\] m
**OR**
\[15\ \text{km} = 1\ 500\ 000\ \text{cm}\]
\[1\ 500\ 000\ \text{cm} \div 250\ 000\] m
\[= 6\ \text{cm}\] ca
*Only get ‘ca’ if they multiply by a power of ten.
**OR**
\[15\ \text{km} \times \sqrt{m} = 0,4\] ✓ a = 6 cm ✓ ca
**OR**
\[250\ 000 \div 100\ 000 = 2,5\]
\[15 \div 2,5\] ✓ a = 6 cm ✓ ca

35
QUESTION 2

2.1.1

\[ a \text{ – (x axis): Time (Minutes)} \]

\[ b \text{ – (y axis): Distance (Km)} \]

\[ c \text{ – Appropriate Heading} \]

2.1.2

\[ 29/30/31 \text{ km} \]

\[ 14/15/16 \text{ only if axis swopped in 2.1.1} \]

2.1.3

Part 5 = Between E and F.

2.1.4

They stopped for supper.

Any mention of a VALID reason for stopping.

They are NOT AT the concert.

2.1.5

\[ 4/5/6 \text{ min} \]

2.1.6

Distance = 45 km – 30 km = 15 km

Time = 45 min – 25 min = 20 minutes

Speed = 15 km ÷ 0,3 hr

Speed = 45 km/h

\[ \text{OR} \]

Speed = 15 km ÷ \sqrt{20} 

Speed = 0,75 \ldots \text{ km/min} \times 60 \text{ m}

Speed = 45 km/h

\[ \text{OR} \]

20 \sqrt{a} \times 3\sqrt{c} = 60

15\sqrt{a} \times 3\sqrt{m} = 45km/h\sqrt{c}

*If swopped axis: D = 20km \ T = 15 min

20 ÷ 0,25 = 80 km/h

*If C and D read correctly but not subtracted, two marks.
### 2.1.7

18h00 + 80 min \(=\) 19h20 \(=\) 19h20 (OR 7:20 p.m.)

- If 18h80: one mark
- If 80min past 18: one mark
- *If axis swapped = 90 min = 19h30

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### 2.2.1

- \(238 \times R35 = R8\,330\)
- \(316 \times R25 = R7\,900\)
- \(R8\,330 + R7\,900 = R16\,230\)

\(R25 \times 238 = R5\,950\) WRONG!
\(R35 \times 316 = R11\,060\) WRONG!
Add = R17\,010 : One mark \(\checkmark\)

\((238 + 316) + (R35 + R25)\) WRONG

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### 2.2.2

- \((554 \div 38) 233\) \(\times 100 = 1,45\%\)
- *If right numbers, wrong order: one mark*

- OR
- \(238 \div 38 = 6,22\%\)
- \(316 \div 38 = 8,27\%\)
- \(6,22\% + 8,27\% = 14,49\%\)

*If they do not add the two % they still get 2 marks
*If \(554 \div (38\,233 - 554) = 1,47\%\)

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### 2.3.1

- Income Meal 1 = \(R35 \times \text{No. of Meals}\)
- Income Meal 2 = \(R25 \times \text{No. of Meals}\)

\(m\) Notion of an equation, i.e. \(an = \text{sign}\); two things on either side related to the scenario.

*Note that any variables can be used, e.g. \(I = 35\ m\)

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### 2.3.2

- \(A = R4\,351\)
- \(B = R8\,330\)
- \(C = R2\,806\)
- \(D = R5\,000\)

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</table>

### 2.4.1

**Cost Analysis for Papa-Q**

- Option A: Income
- Option B: Income
- Option A: Cost
- Option B: Cost
Income graphs correct ✓ a
Cost graphs correct ✓ a
AB in correct order ✓ a ✓ a

<table>
<thead>
<tr>
<th>2.4.2</th>
<th>ca one mark if they label the wrong graphs crossing. aa for correct answer (according to their labels). Meal 1 = 152 ca (Accept 150 – 154) OR Meal 2 = 117 ca (Accept 110 – 120)</th>
<th>3</th>
<th>3</th>
<th>3</th>
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### QUESTION 3

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</table>

#### 3.1

$35 \div 0,12 \text{ m} = R291,67 \ a$

#### 3.2.1

Diameter $= 140 \text{ cm} \div \pi \ (\text{substituting})$

Diameter $= 44,59 \text{ cm} \ (\text{OR} 44,56 \text{ if they used } \pi \text{ on the calculator})$

*No penalisation for rounding(even 45)*

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#### 3.2.2

Radius $= 22,3 \text{ cm} \ (\text{OR})$

Radius $= 22,28 \text{ cm} \ (\text{OR})$

Radius $= 22,29 \text{ cm} \ (\text{OR})$

Previous answer $\div 2$

(OR 22,5)

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#### 3.2.3

Volume of Sphere $= \frac{4}{3} \pi (22,3)^3 \ a \ [\pi = 3,14]$

Volume of Sphere $= 46 428,32051 \text{ cm}^3 \approx 46 428,3 \text{ cm}^3 \ (\text{ca(r)})$

OR

Volume of Sphere $= \frac{4}{3} \pi (22,29)^3 \ a \ [\pi \text{ on calculator}]$

Volume of Sphere $= 46 365,88889 \text{ cm}^3 \approx 46 365,9 \text{ cm}^3 \ (\text{ca(r)})$

OR

Volume of Sphere $= \frac{4}{3} \pi (22,28)^3 \ a \ [\pi = 3,14]$

Volume of Sphere $= 46 303,51326 \text{ cm}^3 \approx 46 303,5 \text{ cm}^3 \ (\text{ca(r)})$

OR

Volume of Sphere $= \frac{4}{3} \times \pi (22,29)^3 \ [\pi \text{ on calculator}]$

$= 46 389,40634 \text{ cm}^3 \approx 46 389,4 \text{ cm}^3 \ (\text{ca(r)})$

OR

Volume of Sphere $= \frac{4}{3} \times \pi (22,28)^3 \ [\pi = 3,14]$

$= 46 303,51326 \text{ cm}^3 \approx 46 303,5 \text{ cm}^3 \ (\text{ca(r)})$

OR

Volume of Sphere $= \frac{4}{3} \times \pi (22,28)^3 \ [\pi \text{ on calculator}]$

$= 46 326,99907 \text{ cm}^3 \approx 46 327 \text{ cm}^3 \ (\text{ca(r)})$

If $r = 22,5$ then $V = 47 688,75 \approx 47 688,8 \checkmark \checkmark \checkmark$
3.3  Volume of Gumball = \( \frac{4}{3} \pi (1,5)^3 \text{ m}^3 \) \[ \pi = 3,14 \]

Volume of Gumball = 14,13 cm\(^3\)

Volume of Sphere ÷ Volume of Gumball

\[ 46428,3 \div 14,13 \text{ m} \]

\[ = 3285,796 \text{ cm} \]

\[ \approx 3285 \text{ cm} \]

*Depending on previous answer and which value of \( \pi \) was used, answers vary from 3,275 to 3,293.

OR

\[ (r^3 \div r^3) = (22,3)^3 \div 1,5^3 \]

\[ = 3285,796 \text{ cm} \]

\[ \approx 3285 \text{ cm} \]

3.4.1  3277 ÷ 150 = 21,8 ca

She will need 22 packets ca(round up)

22 × R34,95 = R768,90 ca

OR

3293 ÷ 150 = 21,95 ca

She will need 22 packets ca

22 × R34,95 = R768,90 ca

*Any value between 3,275 and 3,293 still calculates to 22 packets.

*If they multiply by a fraction of a packet, they only get two marks.

*If R34,95 ÷ 150 = R0,233 per gumball × previous answer.

3.4.2  R768,90 ÷ R300 ma

= 2,563

After 2,6 (or 3) months, Ashley will make a profit. ca

*Could also be repeated subtraction.

**QUESTION 4**

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<td>4.1.1</td>
<td>E6 a</td>
<td>1</td>
</tr>
<tr>
<td>4.1.2</td>
<td>Shoprite (G57) a</td>
<td>1</td>
</tr>
<tr>
<td>4.1.3</td>
<td>Wimpy (G07)aa</td>
<td>1</td>
</tr>
<tr>
<td>OR G10 / G09 / G60 / G59 / G62 / G6 / G42 / G44</td>
<td></td>
<td></td>
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<tr>
<td>4.1.4</td>
<td>Ackermans (G41) a OR Russells (G42) a</td>
<td>1</td>
</tr>
<tr>
<td>OR Jam(G50) a OR Truworths(G44)a</td>
<td>1</td>
<td>1</td>
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</tbody>
</table>
### 4.2.1

\[ P = 135 \text{ m} + 135 \text{ m} + 90 \text{ m} + 90 \text{ m} \]  
\[ P = 450 \text{ m} \]  
*If measured with a ruler: \((7.7\text{cm} + 5\text{cm}) \times 2 = 25.4\text{cm}\)  
*If \(135 + 90 \times 2 = 315\)  

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### 4.2.2

\[ A = 135 \text{ m} \times 90 \text{ m} \]  
\[ A = 12,150 \text{ m}^2 \]  

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### 4.3.1

\[ 10\% \times \sqrt[3]{3299} = 329.9 \]  

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### 4.3.2

\[ 3299 - \sqrt[3]{329.90} = 969.10 \]  
*No marks if they add.  

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### 4.3.3

\[ A = 969.10 \sqrt[3]{1 + 22.1\% \times 2} \]  
\[ A = 281.44 \]  
*If compound interest formula used, then one mark for \(P\), and one mark for \(n = 2\).  

\[ \text{Total Amount} = 281.44 + 329.90 \]  
\[ = 611.34 \]  
(based on addition of previous correct answers)

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### 4.3.4

\[ 281.44 \div 24 \approx 117.83 \]  
*Allow for 5c denominations.  
*If the \(\div 12\) correctly, one mark for ‘ca’ answer.  

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**Total: 20**

### QUESTION 5

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<td>5.1</td>
<td>2006</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5.2</td>
<td>December 2010</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>OR December 2009 / Sept 2009</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*If they answer December 2008 May 2009, they get one mark.</td>
<td></td>
<td></td>
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<tr>
<td>5.3</td>
<td>September</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5.4.1</td>
<td>412 ÷ 12 = 34.3 mm</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5.4.2</td>
<td>136 OR Oct 2010</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5.5</td>
<td>0 15 18 20 22 28 30 31 41 49 136</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Median = ((22 + 28) \div 2)</td>
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<tr>
<td></td>
<td>= 50 \div 2</td>
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<tr>
<td></td>
<td>= 25 mm</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>*If ((49 + 41) \div 2) = 45 One mark.</td>
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*If odd number of data points, then ✓✓ if value chosen correctly.
*If data not ordered then 22 + 14 = 36 mm ✓✓

<table>
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<tr>
<th>5.6</th>
<th>22 ✓✓ mm (^{a}) (^{(\text{unit})})</th>
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<tr>
<th>5.7</th>
<th>136 – 0 = 136 mm (^{ma})</th>
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<td>2 1 1</td>
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<th>5.8</th>
<th>0 15 18 20 22 22 28 30 31 41 49 136</th>
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<tbody>
<tr>
<td></td>
<td>Lower Quartile = 19 (^{a})</td>
</tr>
<tr>
<td></td>
<td>Upper Quartile = (31 + 41) ÷ 2 (^{m}) = 36 mm (^{a})</td>
</tr>
<tr>
<td></td>
<td>IQR = 36 mm – 19 mm (^{m})</td>
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<td></td>
<td>= 17 mm (^{ca})</td>
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<td>5 1 2</td>
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### 5.9.1

**Graph: Average number of sunlight hours in Cape Town**

- **x axis heading**
- **y axis heading**
- **y axis increment**
- **Heading of Graph**

#### Plotting of Graph

- 1 or 2 points wrong: -1
- 3 or 4 points wrong: -2
- 5 or more: -3

*If they started line at zero, they lost one accuracy mark.*

*If the line not joined, minus one accuracy.*

*If drawn a bar graph, minus two marks.*

#### 5.9.2

- **January**
- **December**

*OR Summer months*

#### 5.9.3

- **6 hours**

*OR 180 OR 186*

#### 5.9.4

- **7 hours of sunlight**

*August*

#### 5.9.5

- **19:46**

* m05:28 = 14 hours 18 min

*If 2h18m + 12 = 14 h 18 min

*If just wrote 4,18*

#### 5.10.1

- **R2 700 OR R2 750**

*R2 700 ≤ x ≤ R2 750*

#### 5.10.2

- **R550**

*R500 < x < R600*

*If previous answer ÷ 5 correctly, *

*If R550 ÷ 5*

#### 5.10.3

- **3** (Accept 4 due to rounding up)

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**Total: 150 marks**