GRADE 12

MATHEMATICAL LITERACY

LEARNER HOMEWORK SOLUTIONS
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### TEACHER NOTES

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QUESTION 1

1.1. This means that 75% of the class scored a lower mark than he did ✅ and 25% of the class scored a mark higher than he did. ✅
(2)

1.2. Total number of participants = 20.
Each quartile has 14 of 20 = 5 participants. ✅
Therefore, 88 falls in the fourth quartile. ✅
(2)

1.3. (i) 75\text{th} percentile ✅
(ii) 17,2 ✅
(iii) 13,2 < ✅ BMI < 19,4 ✅
(4)

1.4. (i) BMI = \(301.2^2 = 20,8\) ✅
Falls above the 95 percentile ✅ and is therefore overweight. ✅
(5)
(ii) BMI = 20,6 ✅
\[
20,6 = \frac{w}{(1,65 \text{ m})^2} \]
\[
20,6 \times 1,65^2 = w \]
W = 56 kg ✅
(5)

QUESTION 2

2.1. 51 ✅
(1)

2.2. \(28 \div 100 = 28\%\) ✅ ✅
(3)

2.3. \(21 \div 100 \times 360 = 75,60\) ✅
(3)

[22]
QUESTION 1
The ages (in years) of patients treated for Malaria at two different clinics during a certain month was recorded as follows:

Clinic A: 5 7 18 24 24 32 46 52 63
Clinic B: 37 28 17 56 43 55 39 40 26 35

1.1. Arrange in ascending order: 17, 26, 28, 35, 37, 39, 40, 43, 55, 56
Median = \( \frac{37 + 39}{2} \) = 38

1.2. Mode = 24

1.3. Range = highest – lowest
65 -17 = 39 years

1.4. Mean = \( \frac{17 + 26 + 28 + 35 + 37 + 39 + 40 + 43 + 55 + 56}{10} \) = \( \frac{376}{10} \) = 37,6
≈ 38 years old

1.5. Clinic A because the data shows young children and very old people go to the clinic.

QUESTION 2
2.1. More drivers wear safety belts than front or back passengers. This may not be, as people tend to put their seatbelts on when they see a roadblock.

2.2. Y axis correct, key, X axis shows Gauteng, EC and Mpumalanga all three bars correctly represented. compound bar graph
QUESTION 1

1.1 Probability

a) Red = \( \frac{0}{120} \) \( \checkmark \checkmark = 0 \) \( \checkmark \) \( (3) \)

b) Not white = \( \frac{72}{120} \) \( \checkmark \checkmark = \frac{3}{5} \) \( \checkmark \) \( (3) \)

c) Green or blue = \( \frac{39}{120} + \frac{33}{120} \) \( \checkmark \checkmark = \frac{72}{120} \) \( \checkmark \) = \( \frac{3}{5} \) \( \checkmark \) \( (4) \)

1.2. (a) Probability = \( \frac{1}{4} \) \( \checkmark \)

Toss 1 \( \checkmark \) Toss 2 \( \checkmark \) Outcomes

\[ \begin{align*}
H & \quad HH \checkmark \\
H & \quad HT \checkmark \\
T & \quad TH \checkmark \\
T & \quad TT \checkmark
\end{align*} \]

(b) Probability = \( \frac{2}{4} \) \( \checkmark \checkmark = \frac{1}{2} \) \( \checkmark \) \( (3) \)

[20]

QUESTION 2

Graph B OR Q600 \( \checkmark \checkmark \) The graph was drawn with the months reversed. \( \checkmark \) \( (3) \)

[3]
QUESTION 3

<table>
<thead>
<tr>
<th></th>
<th>Soccer</th>
<th>Rugby</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 8</td>
<td>15 ✓</td>
<td>20 ✓</td>
<td>35</td>
</tr>
<tr>
<td>Grade 9</td>
<td>10</td>
<td>18 ✓</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>38 ✓</td>
<td>63 ✓</td>
</tr>
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3.1. What is the probability that a grade 8 boy chosen randomly will be a soccer player? (2) 
\[ \frac{15}{35} = \frac{3}{7} \]

3.2. What is the probability that a boy chosen randomly will be a rugby player? (2) 
\[ \frac{38}{63} \]
QUESTION 1: 10 minutes

1.1. \( V = \pi r^2 h \)

Circumference = \( \pi D \)

\[
31,4 \text{ cm } = 3,14D \\
\frac{31,4}{3,14} = D \\
10 \text{ cm } = D
\]

\[
V = 3,14 \times (5 \text{ cm})^2 \times 10,5 \text{ cm } \\
V = 824,25 \text{ cm}^3
\]  

(7)

1.2. Dimensions of the label:

Length = circumference + 1 cm

Length = 31,4 cm + 1 cm

Length = 32,4

Breadth = 10,5 cm

(4)

[11]

QUESTION 2: 12 minutes  
(Taken from DoE/Preparatory Exam 2008 Paper 1)

2.1 Volume of cylinder = \( \pi \times (\text{radius})^2 \times \text{height} \)

\[
= 3,14 \times (0,4)^2 \times 1,2 \\
= 0,60288 \text{m}^3 \\
\approx 0,6 \text{m}^3
\]  

(3)

2.2 The volume of Geyser 2 is 768 000 cm\(^3\)

1 000 cm\(^3\) = 1 litre

768 000 cm\(^3\) = 768 cm\(^3\)

(1)

2.3 1 litre = 0,22 gallon

1 litre : 0,22 gallon = 768 litre : \( x \) gallons

\[
\frac{1}{0,22} = \frac{768}{x} \\
x = 0,22 \times 768 \\
= 168,96 \text{ gallons}
\]  

(2)

2.4 Surface area of cylinder = \( 2\pi rh + 2\pi r^2 \)

Surface area of cylinder = \( 2 \times 3,14 \times 0,4 \text{ m } \times 1,2 \text{ m } + 2 \times 3,14 \times (0,4 \text{ m})^2 \)

\[
= 4,0192 \text{ m}^2 \\
= 4,02 \text{ m}^2
\]  

(4)
2.5 1 litre tin of glue : 1,25 m\(^2\) = 5 litre tin : \(x\) m\(^2\)
\[
\frac{1}{1,25} = \frac{5}{x}
\]
\(x = 5 \times 1,25\) m\(^2\) \(\checkmark\)
\(x = 6,25\) m\(^2\) \(\checkmark\)
\[\text{(2)}\]

QUESTION 3: 8 minutes  \(\text{(Taken from DoE/November Exam 2008 Paper 1)}\)

3.1.  \(V = l \times b \times h\)
\[
V = 2,5\) m \(\checkmark \times 2\) m \(\checkmark \times 1,5\) m \(\checkmark\)
\(V = 7,5\) m\(^3\) \(\checkmark\)
\[\text{(4)}\]

3.2.  S.A. = \((l \times b) + 2(l \times h) + 2(b \times h)\) \(\checkmark\)
\[
S.A. = [(2,5 \times 2) + 2(2,5 \times 1,5) + 2(2 \times 1,5)]\) m\(^2\)
\(S.A. = (5 + 7,5 + 6)\) m\(^2\)
\(S.A. = 18,5\) m\(^2\) \(\checkmark\)
\[\text{(5)}\]
SOLUTIONS TO HOMEWORK: SESSION 4
TOPIC 1: PREPARATION 1: EXAMINATION PAPER 1

QUESTION 1: 7 minutes

1.1 65.6% - 53.8% = 11.8% ✓
1.2 Radio ✓
1.3 Video machine ✓
1.4 72.9% × 1000 households
   = 729 households ✓
1.5 Difference in percentage = 53.8% ✓ − 24.4% ✓
   = 29.4% ✓
   OR
   Difference in usage
   = (53.8% of 1 000) ✓ − (24.4% of 1 000) ✓
   = 538 − 244
   = 294 ✓
   OR
   (53.8% ✓ - 24.4% ✓) × 1 000
   = 29.4% × 1 000
   = 294 ✓

QUESTION 2: 11 minutes

2.1 Pythons: R54 000 ✓
2.2 45% ✓
2.3 100% - (45% + 11% + 14%) ✓
   = 30% ✓
2.4 33% of R54 000
   = 0.33 × 54000 ✓
   = R17 820 ✓
2.5 100 × R450 ✓
   = R45 000 ✓
2.6 R450 + (6% of R450)
   = R450 ✓ + (\frac{6}{100} \times R450)
   = R450 + R27 ✓ = R477 ✓
   OR
   1.06 × R450 ✓
   = R477 ✓
2.7 R42 000 − R35 000 ✓
   = R7 000 ✓
QUESTION 3: 12 minutes

3.1. 1 March 2006 – 28 February 2007
   OR
   12 months
   OR
   One year
   OR
   March to February ✓

Local municipality OR Subsidy ✓

(1)

3.2. \[
\frac{308 \ 160}{443 \ 520} \times 100\% \checkmark
\]

\[
= 69,48051948 \% \checkmark
\]

\[
\approx 69,5\% \checkmark\checkmark
\]

(4)

3.3. Average cost of one school uniform

\[
= \frac{10 \ 047}{48} \checkmark
\]

\[
= \text{R209,3125} \checkmark
\]

\[
= \text{R209,31 OR R209,30} \checkmark
\]

(3)

3.4. \[
0,08 : 1 \text{yen} = \frac{57 \ 120}{x}
\]

\[
\frac{0,08}{1} = \frac{57 \ 120}{x} \checkmark
\]

\[
0,08 \cdot x = 57 \ 120
\]

\[
0,08 \cdot \frac{x}{57 \ 120} \checkmark
\]

\[
\frac{0,08}{0,08}
\]

\[
x = 714 \ 000 \text{yen} \checkmark
\]

(3)
SOLUTION TO HOMEWORK: SESSION 4
TOPIC 2: PREPARATION 2: EXAMINATION PAPER 1

QUESTION 1: 17 minutes (Taken from DoE/Nov Exam 2009 Paper 1)

1.1. \[
\begin{align*}
\frac{\text{R399}}{30} & \checkmark \\
= \text{R13,30} & \checkmark
\end{align*}
\]

**OR**

Total number of grams in a box = 500g x 30
= 15 000g \checkmark

Cost of 500g = \[
\frac{\text{R399}}{15 000} \times 500
\] \checkmark

= \text{R13,30} \checkmark

(2)

1.2. 1 or 100% or certain \checkmark \checkmark

(2)

1.3. Temperature in °F = \[
\frac{9}{5} \times 225°C + 32°
\] \checkmark

= 405° + 32°

= 437 °F \checkmark

\approx 435 °F \checkmark

(3)

1.4

1.4.1. Cost of 1 orange = \[
\frac{\text{R9,00}}{12}
\] \checkmark

= \text{R0,75} \checkmark

**OR**

Cost of 1 orange = \[
\frac{\text{R9,00} \times 100}{12}
\] \checkmark

= 75 cents \checkmark

(2)

1.4.2. 1 dozen oranges sell for \text{R12,00} \checkmark

Profit = \text{E12,00} – \text{R9,00}
= \text{R3,00} \checkmark

(2)

1.4.3. Cost = 108 \times \text{R0,75} \checkmark

= \text{R81,00} \checkmark

**OR**

108 oranges = \[
\frac{108 \times \text{R9,00}}{12}
\] \checkmark

= \text{R81,00} \checkmark

(2)
1.5

1.5.1. 52 learners × 1,6m²/learner √
= 83,2m² √  (2)

1.5.2. Number of learners = \( \frac{96}{1,6} \) √
= 60 learners √  (2)

QUESTION 2: 13 minutes  (Taken from DoE/Nov Exam 2009 Paper 1)

2.1. \( \frac{464}{128} \)
\( \frac{29}{8} \) √  (1)

2.2. \( \frac{379}{250} = 1,516 \) √
≈ 1,52 √  (2)

2.3. \( \sqrt{49} + \frac{1}{3}(71-14) \)

= 7 + \frac{1}{3}(57) √ √
= 7 + 19 √
= 26 √  (4)

2.4. 1,25 × 1000 ml √ = 1250 ml √  (2)

2.5. 16% of 1255kg = \( \frac{16}{100} \) × 1255 kg

= 200,8 kg √
New amount = 1255 kg + 200,8 kg √
= 1455,8 kg √

OR

16% increase = 1,16 √
New amount = 1,16 × 1255kg √
= 1455,8kg √  (3)

2.6. $1 = R10,52

$1 215,00 = R10,52 × 1215,00 √
= R12 781,80 √  (2)

[17]  [14]
SOLUTIONS TO HOMEWORK: SESSION 4
TOPIC 3: PREPARATION 3: EXAMINATION PAPER 2

QUESTION 1: 30 minutes (Taken from DoE/Preparatory Examination 2008 Paper 2)

1.1. The annual gross salary
   1.1.1. Mr Sello’s notch (A) = 14 125,25 × 12  
        = R169 503,00  
        (2)
   1.1.2. Monthly deductions (B) = R2350 + R1021,87 + R1562,20  
        = R4934,37  
        (2)

   His take home salary per month after all deductions (C):
        = R14125,25 – R4934,37  
        = R9191,16  
        (4)

1.2.1. The annual gross salary = R169 503,00
   Annual income tax
   = R20250 + [25% × (R169503 – R112500)] – R7740  
   = R20250 + [25% × (R57003)] – R7740  
   = R20250 + R14250,75  
   = R7740  
   = R26 760,75  
   (5)

   The monthly income tax = \frac{R26 760,75}{12}  
   = R2230,06  
   (5)

1.2.2. Too much PAYE tax was deducted from Sello’s September salary. They deducted R2350,00 instead of deducting 2230,06. They have to pay R119,94 back to Mr Sello  
        (3)

1.3.1. The increased rate: \frac{(12000 - 10000)}{10000} × 100% = 20%  
        (3)

1.3.2. 2007. The increase in the value from 2006 to 2007 is greater than for any other pairs of points. The graph is steeper.  
        (3)

1.4.1. 4 weeks × 5 days = 20 newspapers  
        (2)
1.4.2. R4 × 20 = R80,00  
        (2)
1.4.3. R80 – R76 = R4
        \frac{R4}{80} × 100 = 5%  
        (3)

1.4.4. Sello can save a little bit of money in cost of daily newspapers by subscribing at a reduced price. Sello does not have to worry about getting to the shop on a daily basis in order to buy a newspaper. Not only will Sello save money but also transport costs and time. He is supporting the building of a reading nation. (Any two valid reasons.)  
        (4)
SOLUTIONS TO HOMEWORK: SESSION 4  
TOPIC 4: PREPARATION 4: EXAMINATION PAPER 2  

QUESTION 1: 30 minutes  
(Taken from DoE/November Exam 2008 Paper 2)

1.1.1. Fixed monthly cost = \( \frac{R8 400}{12} \) + 4 \( R \times 75 \) 
\[ = R700 + R300 \]
\[ = R 1 000 \]  
(2)

1.1.2. Annual transport costs = R75 \( \times 52 \) 
\[ = R3 900,00 \]  
Total annual costs = R8 400,00 + R3 900,00 
\[ = R12 300 \]  
Average monthly costs = \( \frac{12 300}{12} \) 
\[ = R1 025,00 \]  
The fixed costs for February is R25,00 less than the average monthly fixed costs.✓.

OR

Annual transport costs = R75 \( \times 52 \) 
\[ = R3 900,00 \]  
Average annual transport costs = \( \frac{3 900}{12} \)  
\[ = R325 \]  
February's monthly transport cost = R300  
The monthly travel costs for February is R25,00 less than the average monthly travel costs.✓  
(5)

1.2. 15% reduction means the cost = 85% of R100  
New production cost = 0.85 \( \times R100 \)  
\[ = R85,00 \]  
✓

OR

15% reduction = \( \frac{15}{100} \times R100 = R15 \)  
New production cost: R100 – R15 = R85  
(2)
1.3. 80 is more than 50, so the cost is R85 per duvet set.

Total cost = fixed cost + (no. of duvet sets \times cost per set)

So \( C = R1\,000 + 70 \times R85 \)

\( = R1\,000 + R5\,950 \)

\( = R6\,950 \)

\[ \text{R 1 000 + D} \times R 85 = R 7 800 \checkmark \]

\[ D \times R 85 = R 6 800 \]

\[ D = \frac{R 6 800}{R 85} \checkmark \]

\[ D = 80 \checkmark \]

OR

Production costs for D: R7 800 \( \checkmark \) – R1 000 \( \checkmark \) = R6 800

\[ \therefore D = \frac{R6\,800}{R85} \checkmark \checkmark \]

\[ D = 80 \checkmark \]

OR

\[ \text{R 1 000} \checkmark + 80 \checkmark \times R85 \checkmark = R7 800 \checkmark \]

\[ D = 80 \checkmark \]

(5)
1.4.

INCOME AND EXPENSES

- Plotting given points from table
- Plotting calculated points (C; D)
- Joining points up to (50 ; 6000) with straight lines
- Plotting (51 ; 5335)
- Joining points up to (80 ; 7800) (7)
1.5. Using the graphs:

1.5.1. 20 Duvet sets ✓ ✓

1.5.2. Profit = Income – expenses
   = R12 000 ✓ – R7 800 ✓
   = R4 200 ✓

1.5.3. Profit = Income from 70 sets – Expenses from 80 sets
   = R10 500 ✓ – R7 800 ✓
   = R2 700 ✓