VulaLearn

Subject: Mathematical Literacy

Grade: 11

Written questions

Question 1:

1.1 Calculate 18th term:

$$T_n = 3n + 7$$
$$T_{18} = 3 \times 18 + 7 = 54 + 7 = 61$$

Marks:

- Substitute n=18n=18n=18 correctly (1)
- Multiply and add correctly (2)
  Total: 3 marks

1.2 Sum of first 10 terms:
Sum formula for arithmetic sequence:

$$S_n = \frac{n}{2}(2a + (n-1)d)$$

Here, $a = T_1 = 3(1) + 7 = 10$, $d = 3$, $n = 10$
$$S_{10} = \frac{10}{2}[2(10) + (10-1) \times 3] = 5[20 + 27] = 5 \times 47 = 235$$

1.3 Number of chairs in 8th row:

$$T_8 = 8^2 + 2 \times 8 = 64 + 16 = 80$$

Marks:

- Substitute n=8n=8n=8 (1)
- Calculate square and multiply correctly (1)
- Sum to get answer (1)
  Total: 3 marks

1.4 Identify sequence type and explain:
Sequence is 5,10,20,40,...
Ratio between terms: 10/5=2, 20/10=2, 40/20=2 (constant ratio)
Therefore geometric sequence.
Marks:

- Calculate ratios (1)
- State constant ratio and sequence type (1)
- Provide clear explanation (1)
  Total: 3 marks

Question 2:
2.1 Simple interest:
Total amount = 15,000+4,800=R19,80015,000 + 4,800 =
R19,80015,000+4,800=R19,800
Marks:

- Correct formula (1)
- Correct substitution and calculation (2)
- Correct total amount (1)
  Total: 4 marks

2.2 Compound interest:

$$I = P \times r \times t = 15,000 \times 0.08 \times 4 = R4,800$$

Total amount = 15,000+4,800=R19,80015,000 + 4,800 =
R19,80015,000+4,800=R19,800
Marks:

- Correct formula (1)
- Correct substitution and calculation (2)
- Correct total amount (1)
  Total: 4 marks

2.2 Compound interest:

$$A = P(1 + r)^t = 25,000 \times (1 + 0.10)^3 = 25,000 \times 1.331 = R33,275$$

Marks:

- Correct formula (1)
- Correct substitution (1)
- Correct calculation (2)
  Total: 4 marks

2.3 Discount calculation:

Let original price be x.
Sale price = $x - 0.20x = 0.80x = 1,250$
$x = \frac{1,250}{0.80} = R1,562.50$

Marks:

- Set up equation correctly (2)
- Calculate original price correctly (2)
  Total: 4 marks

2.4 Depreciation:
Value after 2 years:

$$V = 200,000 \times (1 - 0.12)^2 = 200,000 \times 0.7744$$

= R154 880

Marks:

- Correct formula (1)
- Correct substitution (1)
- Correct calculation (2)
  Total: 4 marks

Question 3:

3.1 Perimeter of triangle:

Sum of sides:

$$12.5 + 7.8 + 9.7 = 30.0\,m$$

Marks:

- Sum sides correctly (3)
  Total: 3 marks

3.2 Volume of cylinder:

$$V = \pi r^2 h = 3.14 \times (1.3)^2 \times 5 = 3.14 \times 1.69 \times 5 = 3.14 \times 8.45 = 26.53\,m^3$$

Marks:

- Correct formula (1)
- Correct substitution (1)
- Correct calculation (2)
  Total: 4 marks

3.3 Convert ml to litres:

$$8,250\,ml = \frac{8,250}{1,000} = 8.25\,l$$

Marks:

- Correct division (2)
  Total: 2 marks

3.4 Length of side:

$$s = \sqrt{196} = 14\,m$$

Marks:

- Correct square root calculation (3)
  Total: 3 marks

3.5 Surface area of pool:
Area of base:

$$10 \times 6 = 60\,m^2$$

Area of sides: two long sides: $2 \times (10 \times 1.5) = 30\,m^2$

Two short sides: $2 \times (6 \times 1.5) = 18\,m^2$

Total surface area $= 60 + 30 + 18 = 108\,m^2$

Marks:

- Calculate base area (1)
- Calculate sides area correctly (2)
- Sum total correctly (1)
  Total: 4 marks

Section: Maps, Plans and Graphs

<u>Question 4:</u>
4.1 Actual distance:
Scale 1:50,000 means 1 cm = 50,000 cm = 0.5 km
Distance = 12 cm × 0.5 km = 6 km
Marks:

- Understand scale conversion (1)
- Multiply distance correctly (2)
  Total: 3 marks

4.2 Average sales:

$$\text{Sum} = 2200 + 2350 + 2400 + 2500 + 2600 + 2700 = 14,750$$
$$\text{Average} = \frac{14,750}{6} = 2458.33 \text{ units}$$

Marks:

- Correct sum (1)

- Correct division (2)
  Total: 3 marks

4.3 Meaning of slope:
Slope = rate of change of distance with time, i.e., speed.
Example: If slope is steep, object is moving faster.
Marks:

- Correct definition (2)
- Relevant example/explanation (1)
  Total: 3 marks

4.4 Line graph:
Marks for neatness, correct scales, plotting points, joining points correctly.
Total: 4 marks

Question 5:

5.1 Mean:
Sum = 45 + 52 + 48 + 50 + 52 + 47 + 49 + 53 = 396

396 / 8 = 49.5

Median: Arrange data: 45, 47, 48, 49, 50, 52, 52, 53

Average of 4^{th} & 5^{th} terms = (49+50) / 2

= 49.5

Mode: 52 (appears twice)
Marks:

- Correct mean calculation (2)
- Correct median calculation (2)
- Correct mode identification (2)
  Total: 6 marks

5.2 Number preferring brand C:
Total people = 400
Percentage for C = 100% - (42% + 33%) = 25%
Number = 25% of 400 = 0.25 × 400 = 100 people
Marks:

- Correct percentage calculation (1)
- Correct multiplication (2)
  Total: 3 marks

5.3 Bar graph:
Marks for axes, labels, correct bar heights corresponding to data:
A=168, B=132, C=100 (from percentages × 400)
Total: 4 marks

5.4 Range:
Max score = 53, Min score = 45
Range = 53 - 45 = 8
Marks:

- Correct identification max and min (1)
- Correct subtraction (1)
  Total: 2 marks