SENIOR SECONDARY IMPROVEMENT PROGRAMME 2013

education
Department: Education
GAUTENG PROVINCE

GRADE 12

MATHEMATICAL LITERACY

LEARNER HOMEWORK SOLUTIONS

The SSIP is supported by

TABLE OF CONTENTS

LEARNER HOMEWORK SOLUTIONS

SOLUTIONS TO HOMEWORK: SESSION 5

TOPIC 1: CONSOLIDATION EXERCISE: VOLUME, SURFACE AREA, SCALE AND MISLEADING STATISTICS.

QUESTION 1: 15 minutes

1.1 i) The circular cake (Design 1)

Volume = $\pi \times r^2 \times ht$

Volume = π × (14 cm ✓)^2 ×8 cm ✓)

Volume = 4926,017..cm^3 ✓

Volume = 4926 cm^3 ✓ (4)

ii) The square cake (Design 2)

Volume = $l \times b \times ht$

Volume = 20 cm × 20 cm ✓ × 12 cm ✓

Volume = 4800 cm^3 ✓ (3)

1.2 i) Cake Design 1 has the largest volume. ✓ (1)

ii) $\frac{4926 - 4800}{4800} \times 100\%$

$= \frac{126}{4800} \times 100\%$ ✓✓

= 2,625%✓ (3)

1.3 i) $\frac{4800\ cm^3}{64\ cm^3}$ ✓ = 75 pieces ✓ (2)

ii) 75 pieces ÷ 25 children ✓ = 3 pieces each. ✓ (2)

[15]

QUESTION 2: 18 minutes

2.1 Litres needed:

2.1.1 Hydrated lime
12 cups lime = 12 × 237 ml ✓
= 2844 ml✓
= 2,822 litres✓ (3)

2.1.2 Water
2 gallons = 8 pints × 2
= 16 pints ✓× 473,2 ml
= 7571,2 ml ✓
= 7,5712 litres ✓ (3)

2.2 Space' in litres is not filled with mixture?
4 cups salt = 4 × 237 ml
= 498 ml
= 0,498 litres ✓

5 gallons = 5 × 8 pints × 473,2 ml
= 18 928 ml
= 18,928 litres ✓

Space left in bucket = 18,928 litres – (2,822 litres + 7,5712 litres + 0,498 litres)
= 18,928 litres ✓ – 10,8912 litres ✓
= 8,0368 litres
≈ 8 litres ✓ (5)

2.3 Buckets of lime are needed to mark 4 netball courts.
2 horizontal lines + 4 vertical lines + centre circle + 2 semi circles (1 full circle)
= (2×30,5 m) + (4 × 15,25 m) + (π × 0,9 m) + [π ×(4,9 m × 2 ✓)] ✓
= 155,6150.. m ✓

For 4 fields = 155,6150.. m × 4 = 622,46016... m ✓

Buckets needed = 622,46016... m ÷ 100 ✓ = 6,22460... buckets ✓
∴ 7 buckets are needed ✓ (7)
[18]

SOLUTIONS TO HOMEWORK: SESSION 5

TOPIC 2: CONSOLIDATION EXERCISE - RATIO, PERCENTAGE, BEST BUYS, DATA HANDLING, EQUATIONS, PIE CHARTS.

QUESTION 1: 21 minutes

1.1. x = 400 ✓ (1)

1.2. The Droop quota

1.2.1. $\frac{17\,680\,729}{400+1} + 1$ ✓ = 44092,59 ✓

$\approx$ 44093 ✓... (3)

1.2.2. For the 2009 elections, a party had to get 44093 votes ✓ to get a seat in Parliament. ✓ (2)

1.3. IFP = 18 seats ✓ (1)

1.4. PAC got 0% ✓ (1)

1.5. % Change

$$= \frac{17680729 - 19533498}{19533498} \times 100\%$$ ✓✓

$$= \frac{-1852769}{19533498} \times 100\%$$

= – 9,485... %

$\approx$ 9,5% ✓ decrease ✓ (4)

1.6. Didn't vote = 23 181 997 – 17 919 966 ✓

= 5 262 031 ✓ (2)

1.7. Registered voters cast valid votes $= \frac{17680729}{23181997} \times 100\%$ ✓

= 76,269... % ✓

$\approx$ 76,3% ✓ (3)

1.8. Probability of:

1.8.1. Vote for the PAM = 0,03% ✓✓ (2)

1.8.2. No votes for the DA 0% ✓✓ (2)

[21]

QUESTION 2: 16 minutes

2.1. Travellers came to South Africa to study $= \frac{77000}{5908000} \times 100\%$ ✓

$= 1,3033..\%$

$= 1,3\%$ ✓ (2)

2.2. Percentage change $= \frac{7518 - 6640}{6640}$ ✓✓× 100%

$= \frac{1610}{5908} \times 100\%$

$= 13,2228...\%$

$= 13,2\%$ ✓ increase ✓ (4)

2.3. Over the years ✓ the number of foreign travellers to South Africa increases.✓ (2)

2.4. Study the pie chart below and answer the questions that follow.

2.4.1. Travellers to study

$= 100\% – (23\% + 14\% + 17\% + 22\%)$

$= 100\% – 76\%$ ✓

$= 24\%$ ✓ (2)

2.4.2. 14% in 2001

$77 + 94 + 123 + 137 + 133 = 564$

$\frac{77}{564}$ ✓✓× 100% $= 13,652...\%$

$= 14\%$ ✓ (3)

2.4.3. Angle represented by the 2003 sector

$\frac{123}{564}$ ✓ × 360° ✓ $= 21,8085...°$

$= 22°$ ✓ (3)

[16]

SOLUTIONS TO HOMEWORK: SESSION 6

TOPIC 1: CONSOLIDATION EXERCISE: CALCULATOR WORK, FINANCE, TABLES, PERCENTAGES, VOLUME, INCOME TAX

QUESTION 1: 16 minutes (*Taken from DoE November Exam 2008 Paper 2)*

1.1. Increase R1 250.00 by 24%.
= R2 250,00 + (24% of R2 250,00)
= R1 250,00 + ($\frac{24}{100}$ × R1 250,00) ✓
= R1 250,00 + R540,00 ✓
= R2 790,00 ✓ (3)

1.2. Thandi is considering buying a dishwasher that she will use to wash the dishes daily.

1.2.1. Volume of the basin = $\pi r^2 h$
= 3,14 × (30 cm)^2 × 40 cm ✓
= 113 040 cm^3 ✓ (2)

1.2.2. Half of the volume of the basin = $\frac{113040\ \text{cm}^3}{2}$ ✓✓
= 56 520 cm^3 ✓
= 56,52 litres ✓
Each time she washes and rinses the dishes she uses:
56,52 ℓ × 2 half-filled basins = 113,04 litres ✓

Thus water used to wash three times a day:
113,04 litres × 3 washings per day = 339,12 litres ✓ (6)

OR

Two half-filled basins = 1 full basin ✓✓
∴ Volume = 113,04 litres ✓

Thus, Volume/day = 3 ✓ × 113,04 litres ✓
= 339,12 litres ✓

1.2.3. a) Water this dishwasher would use to wash Thandi's dishes daily.
According to the advertisement, the dishwasher would use = $\frac{339{,}12}{9}$ ℓ ✓
= 37,68 ℓ ✓ (2)

OR

Half of the volume = 56,52 ℓ

$\frac{1}{9}$ th of half of the volume = $\frac{56{,}52\ell}{9}$ = 6,28 ✓ ℓ

2 halves of the basins = 2 $\times$ 6,28 ℓ = 12,56 ℓ

3 times a day = 3 $\times$ 12,56 ℓ

= 37,68 ℓ ✓

b) Thandi would save 301,44 ℓ per day ✓, which seems to be an exaggeration and thus is not realistic. Thandi would be saving water. ✓✓ (3)

[16]

QUESTION 2: 14 minutes

2.1. How much tax would a person earning R140 000 pay?

= R140 000 × 18%

= R140 000 × $\frac{18}{100}$ ✓

= R25 200 ✓ (2)

2.2. How much tax, a month, would a person earning R230 000 pay?

Tax = R45 450 + (30% of amount above R221 000) ✓

Tax = R45 450 + [$\frac{30}{100}$ × (R230 000 – R221 000)] ✓

Tax = R45 450 + [$\frac{30}{100}$ × R9 000 ✓)

Tax = R45 450 + R2 700✓

Tax = R48 150 ✓

$\therefore$ Tax per month = $\frac{R48150}{12}$ ✓

= R4 012,50 ✓ (7)

2.3. Annabel and her friend are discussing salaries.

Tax bracket 2 = R25 200 + 25% of (R178 940 – R140 000)

= R25 200 + (25% × R38 940 ✓)

= R25 200 + R9 735 ✓

$\therefore$ Tax = R34 935✓

Nett Income = Gross income – tax

= R178 940 – R34 935 ✓

= R144 005

$\therefore$ Her friend is incorrect as Annabel rounded her off annual and the difference is only R5. ✓ (5)

[14]

SOLUTIONS TO HOMEWORK: SESSION 6

TOPIC 2: CONSOLIDATION EXERCISE: EXCHANGE RATE, DATA HANDLING, GRAPHS, PERCENTAGE, RATIO

QUESTION 1

1.1. 17 years ✓ (1)

1.2. 17 years ✓ (1)

1.3. Mean age

$$= \frac{16+16+16+17+17+17+17+17+18+18+19+19+19+20+22}{15} \checkmark\checkmark$$

$$= \frac{268}{15} \checkmark$$

= 17,8666 … years ✓

= 17,87 years ✓ (5)

[7]

QUESTION 2

2.1. 200 learners ✓ (1)

2.2. 34 learners ✓ (1)

2.3. $\frac{24}{200}$ ✓✓× 100%

= 12% ✓ (3)

2.4. Only 12% of the learners attempt to matriculate. ✓ (1)

2.5. They leave school at or before the end of their Grade 9 year. ✓ (1)

2.6. 20% of 200 learners ✓

$= \frac{20}{100}$ × 200 learners ✓

2.7. = 40 learners ✓ (3)

2.8. 67% of 200 learners ✓

$= \frac{67}{100}$ × 200 learners ✓

= 134 learners ✓

= 12 years or younger ✓ (16 + 18 52 + 48 = 134) (4)

[14]

QUESTION 3

3.1.

Graph A	Graph B
Tests in wrong order ✓ Total appears to be of 9 not 20 ✓ Results = $\frac{8}{9}$ and $\frac{4}{9}$	Tests in wrong order Results not easily seen e.g. Test 2 $\frac{4/5/6}{20}$ ✓ OR any other valid observations (3)

3.2. Graph A ✓ (1)

[4]

QUESTION 4

4.1 P(Boy in Grade 12) = $\frac{60}{302}$ ✓✓

= $\frac{30}{151}$ ✓ (3)

4.2 Number of learners NOT in Grade 10 = 77 + 60 = 137 ✓

P(not in Grade 10) = $\frac{137}{302}$ ✓✓ (≈ 0,45 or 45,36%) (3)

[6]