E-mail : Info@saolympiads .co.za website: www.saolympiads .co.za

SA OLYMPIADS

GRADE 10 -11

MATHEMATICAL LITERACY OLYMPIADS SCOPE AND GUIDE

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Aim & Paper structure of the olympiad

The aim of the paper is two fold namely to test wholistic knowledge of the Mathematical Literacy subject (syllabus), plus the ability to think beyond the syllabus.

These Olympiads will assist learners in preparation to write the NBT, job assessments, and other entrance examinations for tertiary institutions across the globe. It will also prompt learners to develop skills such as logic which is invaluable.

It is important for teachers to read through the paper with the learners.

The are 20 questions with 15 being multiple choice and 5 being open ended.

Learners should be familiar with the following scope relevant to each Grade.

No calculator is allowed.

GRADE TEN:

A. SCOPE IN RESPECT OF MATHEMATICAL LITERACY OLYMPIAD

1. NUMBERS
2. RATE AND RATIO
3. DIRECT AND INVERSE PROPORTION
4. BASIC ALGEBRA
5. PERIMETER
6. AREA INCLUDING SURFACE AREA
7. VOLUME
8. AVERAGE GRADIENT
9. PERCENTAGES
10. HIRE PURCHASE
11. PROBABILITY
12. FOREIGN EXCHANGE
13. LOGIC
14. BASIC GEOMETRY INCLUDING THEOREM OF PYTHAGORAS

B. PRACTICE QUESTIONS

We aim to provide at least one practice question is provided per section which is related to the scope above (In some cases this may not achieved).

1. **Evaluate:**

   20 + $\frac{1}{10}$ x 20

2. **Evaluate:**

   1440 x 112 – 111 x 1440 – 1440

3. **Evaluate:**

   128 x $2\frac{3}{4}$

4. **When $\frac{4}{9}$ is written as a repeating decimal fraction then write down the sum of the 30 digits after the decimal point.**

5. **To cook 300 grams of rice one needs 3.5 litres of water. How much water in litres, at this rate, would be needed to cook 450 grams of rice?**

6. **All items in a departmental store were reduced by 20% and then by a further 20%. What is this as one %?**

7. **Leticia's monthly salary was increased by 8% to R25920. What was her salary before the increase?**

8. **Fruit juice is mixed in the ratio of water to concentrate as 5:2. Pam wished to make 350 litres of fruit juice. How many litres of concentrate does she need?**

9. **The distance in m an object travels in t minutes is given by:**

   $d(t) = -t^2 + 60t$

   Determine the average velocity in m/min over the first 4 minutes.

10. A vehicle covers a distance of 255km in 3 hours. If the vehicle maintains the same average speed, then how long will it take to cover 850km.

11. The area of a rectangular land is 24 000m^2. If the width is 20m less than the length, then determine the cost of precast fencing at R240 per metre.

12. In a 200m race Appy beat Betty by 20m. What lead must Appy give Betty to finish the race together?

13. A cylindrical container with uniform height has radius 3.5m. The volume of the liquid in this closed container is 154m^3. Determine in m^2 the surface area of this closed container.

14. A hiring company charges R500 per day and a fixed charge of R2000. If the number of days is 'n' then determine the calculating rule in terms of 'n'.

15. Jerrico purchased furniture and appliances for R48000. He was charged simple interest at 9% per annum. Determine the monthly instalment if this had to be paid off in 3 years.

GRADE 11:

A. SCOPE IN RESPECT OF MATHEMATICS OLYMPIAD

1. NUMBERS INCLUDING PATTERNS
2. RATE AND RATIO
3. DIRECT AND INVERSE PROPORTION
4. BASIC ALGEBRA – MATHEMATICAL MODELING
5. PERIMETER
6. AREA INCLUDING SURFACE AREA
7. VOLUME
8. AVERAGE GRADIENT
9. PERCENTAGES
10. HIRE PURCHASE
11. PROBABILITY
12. FOREIGN EXCHANGE
13. LOGIC
14. BASIC GEOMETRY INCLUDING THEOREM OF PYTHAGORAS

B. Practice Questions

We aim to provide at least one practice question is provided per section which is related to the scope above (In some cases this may not achieved).

1. **Evaluate:**

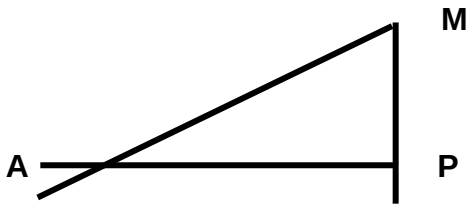
   2233 x 2237 – 2236 x 2234

2. **When $\frac{1}{12}$ is written as a repeating decimal fraction then write down the sum of the 25 digits after the decimal point.**

3. **A group of waitrons earned service charges of 15% on sales. If the sales for the day was R50 600 then determine the service shared by 5 waitrons.**

4. **The gradient of a driveway AM is $\frac{1}{4}$.**

   If AP = 4.8m then determine the height PM.



5. **Profits were shared between Tes and Rea in the ratio 5:3. If Ria received R36000 then determine how much did Tes received?**

6. **Tickets were sold at R200 and R150. Twice the number of R200 tickets were sold as R150. If the total amount from the sale of tickets is R82500 then determine the number of R150 tickets sold.**

7. **350ml of pure honey cost R96. How much will 2 litres of pure honey at this same rate cost?**

8. **To dilute 10 litres of paint, 14 litres of water is used. How many litres of water is required to dilute 30 litres of paint?**

9. **20 litres of petrol was used from Durbs to Coast which is 240 km away Determine the rate as litres per 10km.**

10. **Tiles are 30cm by 30cm. How many full tiles would be needed to tile a room 6m by 4m?**

11. **A company manufactures 10" ipads.**

    The following is a breakdown of costs and charges:

    - **Fixed cost (FC)– R100 000**
    - **Variable cost (VC) R800**
    - **Selling price (SP) R1800**

    Use the break-even point formula $\frac{FC}{SP-VR}$ to determine the break-even point.

12. **A bag contains 8 blue blocks and 6 white blocks. A block is drawn at random and not replaced. A second block is drawn. What is the probability of drawing a white block followed by a blue block?**

13. **80 learners had to select at least one of two subjects namely Life Sciences and Tourism. They selected as follows:**
    - **55 selected Life Sciences.**
    - **45 selected Tourism.**

    What is the probability that a learner selected at random would be doing Tourism only?

14. **The following exchange rates apply:**
    - **3 Ps for 4 Rs**
    - **4 Fs for 6 Gs**
    - **5 Ps for 3 Gs**

    How many R's can one get for 3 Fs?

15. **10 pipes are required to fill a tank in 3 hours, all working at the same rate. How long will it take 6 pipes all working at the same rate to fill the tank?**