

THE SOUTH AFRICAN MATHEMATICS OLYMPIAD

organised by the SOUTH AFRICAN ACADEMY OF SCIENCE AND ARTS
in collaboration with OLD MUTUAL, AMESA and SAMS

SPONSORED BY OLD MUTUAL

FIRST ROUND 1998
JUNIOR SECTION: GRADES 8 AND 9
10 MARCH 1998
TIME: 60 MINUTES
NUMBER OF QUESTIONS: 20

Instructions:

1. Do not open this booklet until told to do so by the invigilator.
2. This is a multiple choice question paper. Each question is followed by answers marked A, B, C, D and E. Only one of these is correct.
3. Scoring rules:

Each correct answer is worth: 3 marks in Part A,
 5 marks in Part B and
 7 marks in Part C.

There is no penalty for an incorrect answer or an unanswered question.

4. You must use an HB pencil.

Rough paper, ruler and rubber are permitted.

Calculators and geometry instruments are not permitted.

5. Diagrams are not necessarily drawn to scale.
6. Indicate your answers on the sheet provided.
7. When the invigilator gives the signal, start the problems.
You will have 60 minutes working time for the question paper.

DO NOT TURN THE PAGE
UNTIL YOU ARE TOLD TO DO SO.

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PRACTICE EXAMPLES

1. $14 + 8 - 2 =$

- (A) 8 (B) 14 (C) 18 (D) 20 (E) 22

2. If $2x - 8 = 0$, then x is equal to

- (A) 1 (B) 2 (C) 4 (D) 6 (E) 8

3. Arrange the numbers 0,523; 0,458; 1,003; 0,791 from smallest to largest.

- (A) 0,458; 0,523; 0,791; 1,003
(B) 0,523; 0,791; 1,003; 0,458
(C) 0,458; 0,791; 0,523; 1,003
(D) 1,003; 0,791; 0,523; 0,458
(E) 0,523; 0,458; 1,003; 0,791

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PART A: (Each correct answer is worth 3 marks)

1. $\frac{7}{5}$ is equal to
(A) 1,2 (B) 1,5 (C) 1,7 (D) 1,6 (E) 1,4
2. 50% of 50 equals
(A) 1 (B) 2,5 (C) 25 (D) 50 (E) 2 500
3. $12,34 - 1,234$ equals
(A) 11,106 (B) 11,114 (C) 11,006 (D) 11,116 (E) 11,104
4. What mass, in kilograms, is indicated on the scale?
(A) 42,0 (B) 40,2 (C) 44,0
(D) 40,4 (E) 45,0
5. The value of $\frac{1 \times 9 \times 9 \times 8}{1 + 9 + 9 + 8}$ is
(A) 1 (B) 4 (C) 0 (D) 27 (E) 24

PART B: (Each correct answer is worth 5 marks)

6. The desks in a classroom are arranged in straight rows. John is in the third row from the front and the fourth row from the back. He is also third from the left end of a row and fifth from the right. How many desks are in the classroom?
(A) 24 (B) 30 (C) 35 (D) 42 (E) 56

7. In a contest to guess the number of balloons in a bunch, Sarah guessed 25, Betty guessed 31, Nomsa guessed 29, Jakkie guessed 23 and Edith guessed 27. Two guesses were wrong by 2, and two guesses were wrong by 4. The other guess was correct. The number of balloons in the bunch was
- (A) 29 (B) 27 (C) 25 (D) 31 (E) 23
8. If $3!$ means $1 \times 2 \times 3$, thus $3! = 6$ and if $4!$ means $1 \times 2 \times 3 \times 4$, thus $4! = 24$, then $6!$ is equal to
- (A) 120 (B) 384 (C) 720 (D) 1008 (E) 5040
9. How many different rectangles, with natural numbers as side lengths, can be constructed so that the perimeter of each rectangle is 16?
- (A) 7 (B) 5 (C) 4 (D) 2 (E) 1
10. Sipho has made a cylindrical clay pot. His sister, Thandi, wants to decorate it with a triangular pattern as shown in the sketch. If the triangles are equilateral, of side 5 cm and the circumference of the pot is 1 metre then the total number of triangles in the pattern is
- (A) 20 (B) 40 (C) 39 (D) 30 (E) 29
11. Which one of the following fractions lies between $\frac{1}{2}$ and $\frac{2}{3}$?
- (A) $\frac{17}{24}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{7}{12}$ (E) $\frac{3}{4}$

12. In the diagram the lengths of some of the sides are indicated using letters. The length of p in terms the other letters is
- (A) $w - x - y$
 (B) $w - 3x - 2y$
 (C) $w - 3x + 2y$
 (D) $w + x + y$
 (E) $w + 3x + 2y$
13. The greatest number of Mondays which can occur in 45 consecutive days is
- (A) 5 (B) 6 (C) 7 (D) 8 (E) 9
14. If $\hat{AOB} = 60^\circ$ and $\hat{COD} = 30^\circ$, the fraction of the area of the circle which is shaded is
- (A) $\frac{1}{3}$ (B) $\frac{1}{9}$ (C) $\frac{1}{6}$
 (D) $\frac{1}{5}$ (E) $\frac{1}{4}$
15. A beam of light shines from a point S, reflects off a reflector (mirror) at point P, and reaches a point T so that PT is perpendicular to RS. Then x is
- (A) 26 (B) 32 (C) 37
 (D) 38 (E) 45

PART C: (Each correct answer is worth 7 marks)

16. A march goes through the streets from the School (S) to the Community Centre (CC) If the march can only travel East or South, then the number of different possible routes is

- (A) 6 (B) 10 (C) 4 (D) 8 (E) 9

17. ($2^3 = 2 \times 2 \times 2$ and $2^5 = 2 \times 2 \times 2 \times 2 \times 2$)

If $2^x + 3^y = 41$, where x and y are natural numbers, then the value of $x + y$ is

- (A) 9 (B) 8 (C) 7 (D) 6 (E) 5

18. The last digit of the number 3^{100} is

- (A) 0 (B) 1 (C) 3 (D) 7 (E) 9

19. Saul plays a video game in which he scores 4 for a hit and -6 for a miss. After 20 rounds his score is 30. The number of times he has missed is

- (A) 5 (B) 10 (C) 6 (D) 15 (E) 4

20. Solomon went to the shopping centre to buy supplies for his mathematics project. He spent half of what he had plus R2 in the first shop, half of what he then had left plus R1 in the second shop, half of what he then had left plus R1 in the third shop and, in the fourth shop half of all he had left. Three rand was left over. How much money did he start with?

- (A) R32 (B) R48 (C) R56 (D) R64 (E) R72
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ANSWER POSITIONS: JUNIOR FIRST ROUND 1998

PRACTICE EXAMPLES	POSITION
1	D
2	C
3	A

NUMBER	POSITION
1	E
2	C
3	A
4	C
5	E
6	D
7	B
8	C
9	C
10	B
11	D
12	B
13	C
14	E
15	B
16	B
17	C
18	B
19	A
20	D

DISTRIBUTION	
A	2
B	6
C	6
D	3
E	3
TOTAL	20

Password: samo