

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 2000
JUNIOR SECTION: GRADES 8 AND 9
12 APRIL 2000
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 5 marks. 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.
KEER DIE BOEKIE OM VIR AFRIKAANS

P.O. BOX 538, PRETORIA, 0001 TEL: (012) 328-5082 FAX (012) 328-5091
E-mail: akademie@mweb.co.za

PRACTICE EXAMPLES

1. $23 + 6 - 4 =$

(A) 6

(B) 23

(C) 25

(D) 29

(E) 33

2. $\frac{1}{5} + \frac{2}{3} \times \frac{1}{2}$ equals

(A) $\frac{1}{15}$

(B) $\frac{3}{11}$

(C) $\frac{21}{50}$

(D) $\frac{8}{15}$

(E) $9\frac{4}{5}$

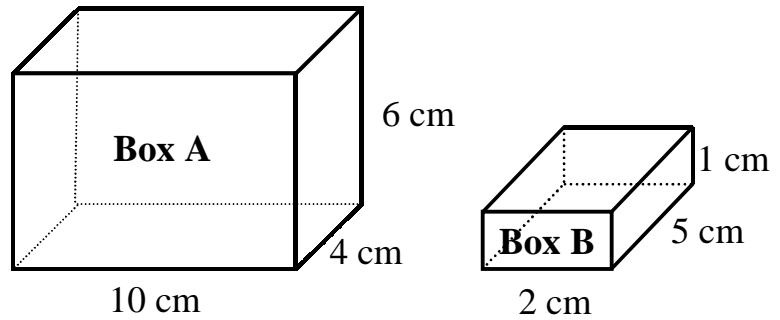
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1. $\frac{1}{2} - \frac{1}{2} \times \frac{1}{2}$ equals

- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$ (C) 0 (D) $\frac{1}{8}$ (E) $-\frac{1}{2}$

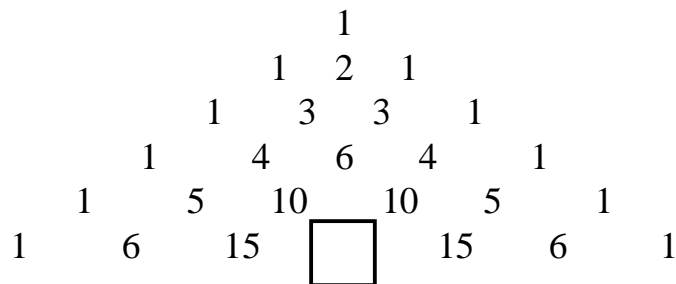
2. How many boxes identical to Box B will fill Box A exactly?

- (A) 24 (B) 10
(C) 12 (D) 18
(E) 5



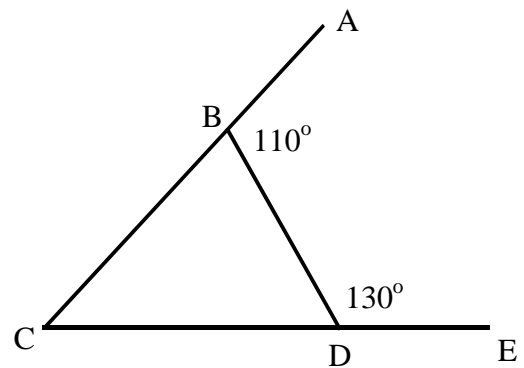
3. What number should be in the square in the following pattern of numbers?

- (A) 5
(B) 20
(C) 21
(D) 10
(E) 25



4. In the figure, CBA and CDE are straight lines.
If $\hat{ABD} = 110^\circ$ and $\hat{EDB} = 130^\circ$,
then \hat{C} equals

- (A) 30° (B) 40° (C) 50°
(D) 60° (E) 70°



5. The value of $0,3 \times 0,4 + 0,3 \times 0,9$ is

- (A) 3,9 (B) 0,189 (C) 1,3 (D) 0,78 (E) 0,39

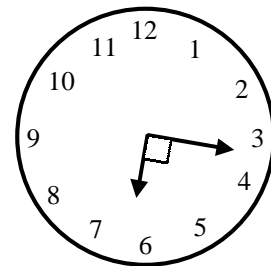
6. If $a \ominus b = (2 \times a) + (3 \times b)$ then the value of $2 \ominus (3 \ominus 5)$ is

(A) 30 (B) 19 (C) 41 (D) 21 (E) 67

7. $\frac{10^4}{5^4}$ equals

(A) 16 (B) 2 (C) 1 (D) 625 (E) 4

8. The number of times the hour hand and the minute hand of a clock form a right angle with each other between 06:00 and 12:00 on the same day is

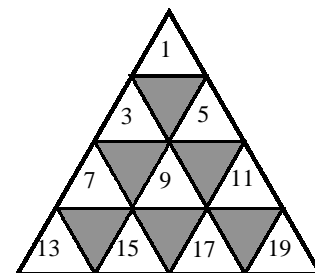


(A) 12 (B) 11 (C) 10
(D) 6 (E) 5

9. The average (arithmetic mean) of three numbers is 18. If one of the numbers is replaced by the number 38, then the average of the three numbers is 23. The original number that was replaced is

(A) 38 (B) 23 (C) 15 (D) 18 (E) 33

10. If the following pattern continues and the numbers in the 100th row are added, the answer will be

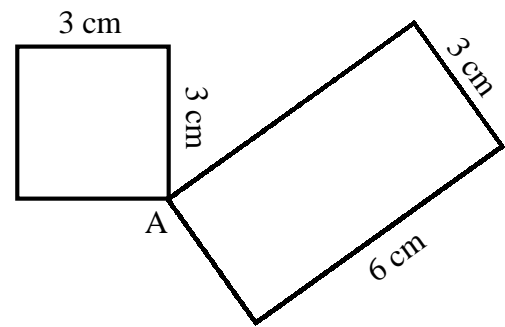


(A) 1 000 000 (B) 1 600
(C) 1 000 (D) 10 000
(E) 100 000

11. It takes 8 hours to fill $\frac{4}{5}$ of a container with water. The time, in hours, that it takes to fill the remainder of the container, at the same rate, is

(A) 1 (B) 4 (C) 2 (D) 1,6 (E) 2,5

12. Two ants start at point A and walk at the same pace. One ant walks around a 3 cm by 3 cm square whilst the other walks around a 6 cm by 3 cm rectangle. What is the minimum distance, in centimetres, any one must cover before they meet again?



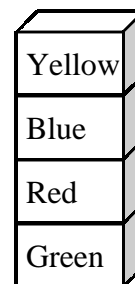
(A) 18 (B) 72 (C) 216 (D) 36 (E) 108

13. The letters A to I represent numbers. The numbers are added vertically and horizontally to give the numbers in the last row (17 ; P ; Q) and the last column (20 ; 14 ; 12). The value of $P + Q$ is

A	B	C	20
D	E	F	14
G	H	I	12
17	P	Q	

(A) 29 (B) 32 (C) 31
(D) 26 (E) 28

14. Four cubes of equal size are given. One is coloured green, one red, one blue and one yellow. The number of different ways they can be stacked one upon the other is



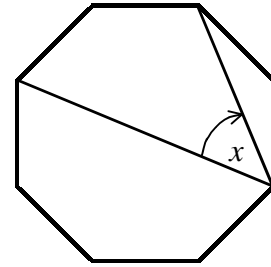
(A) 4 (B) 9 (C) 16
(D) 24 (E) 64

15. Mary was given the task of removing all multiples of 2 and 3 from the set of numbers from 1 to 100. The number of numbers that remained was

(A) 17 (B) 33 (C) 18 (D) 34 (E) 26

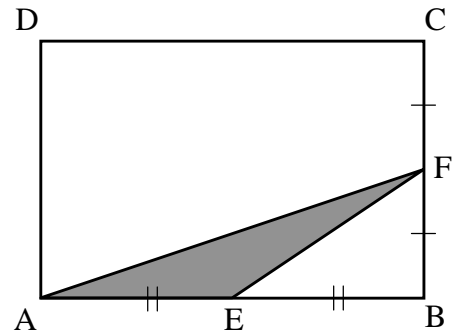
16. The size of angle x , in degrees, in the regular octagon is

(A) 90 (B) 67,5 (C) 45
(D) 60 (E) 75



17. ABCD is a rectangle. E and F are midpoints of AB and CB respectively. If the area of the shaded $\triangle AEF$ is 7 cm^2 , then the area of rectangle ABCD, in square centimetres, is

(A) 28 (B) 49 (C) 42
(D) 35 (E) 56



18. Three rulers and one pencil cost the same as two erasers. One ruler, two pencils and three erasers cost R25. If the price of each item is a whole number of Rands, then the price of an eraser is

(A) R2 (B) R3 (C) R4 (D) R5
(E) impossible to find

19. Increasing $800 - 10x$ by 10% gives $600 - 6x$. The value of x equals

(A) 45 (B) 40 (C) 56 (D) 80 (E) 50

20. The sum of the first n odd natural numbers is 2304.

$$\underbrace{1 + 3 + 5 + 7 + 9 + \dots}_{n \text{ numbers}} = 2304$$

The value of n is

(A) 123 (B) 50 (C) 46 (D) 48 (E) 69

THE END

ANSWER POSITIONS: JUNIOR FIRST ROUND 2000

PRACTICE EXAMPLES	POSITION
1	C
2	D

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

DISTRIBUTION	
A	4
B	5
C	3
D	5
E	3
TOTAL	20