FEMSSISA MATHEMATICS OLYMPIAD: Grade 8 - 12

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MATHEMATICS OLYMPIAD GRADE EIGHT

DATE: 4 AUGUST 2025

TIME: 90 MINUTES

INSTRUCTIONS:

1. This booklet has 15 multiple choice and 5 open ended questions.
2. Use the answer sheet provided.

   Circle the letter corresponding to your answer.
3. All working details must be done in the space provided.
4. Calculators are not permitted.
5. Diagrams are not necessarily drawn to scale.
6. The first 15 problems carry 1 mark each and the next 5 carry 2 marks each.
7. You have 90 minutes for the paper which works out to an average of 4.5 minutes per question.
8. Read the questions carefully before answering.
9. Visit the website: www.saolympiads.co.za.

Grade Eight Mathematics Olympiad

1. Evaluate: 85 x 39 – 17 x 49 x 5?
   (A) -650 (B) -750 (C) -850 (D) 850

2. Determine the value of E if x = -1 where $E = 3x^3 + 5x^2 - 1$
   (A) -1 (B) 1 (C) 2 (D) -2

3. Subtract:
   $4x - 5y$
   $\underline{6x - 5y}$

   (A) -x-3y (B) 2x+y (C) –2x- y (D) –2x

4. Determine the following product:
   -3x (-2x - y)

   (A) $6x^2 + 3xy$ (B) $6x^2 - 3xy$ (C) $-6x^2 + 3xy$ (D) -6x - 3xy

5. A recipe for a cake requires 25g of butter. How much of butter in grams will be required to bake 48 such cakes?
   (A) 1220 (B) 1200 (C) 1180 (D) 1140

6. For what values of m will this 5 digit number 71m96 is divisible by 11?
   (A) 9 (B) 8 (C) 7 (D) 6

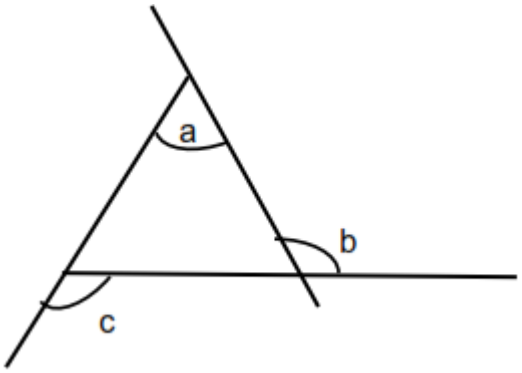
7. If $\frac{3}{8}$ of the production in a week is 210 items, then what is $\frac{1}{2}$ of the number of the items?
   (A) 320 (B) 300 (C) 280 (D) 260

8. Evaluate:

   $$\mathbf{36 \times 29\ \frac{4}{9}}$$

   (A) 1160 (B) 1080 (C) 1060 (D) 1040

9. Find the value of a, if b+c = 200^0 and all the sides of the triangle is produced.



(A) 50^0 (B) 40^0 (C) 30^0 (D) 20^0

10. If the difference of an angle's supplement and twice its complement is 55^0, then find the angle.

(A) 52^0 (B) 55^0 (C) 50^0 (D) 80^0

11. 125 cubes measuring 1cm with all white faces are used to form one large cube. Five of the adjacent faces are painted green. These cubes were then dismantled. How many cubes now have 2 green faces?

(A) 28 (B) 32 (C) 36 (D) 40

12. Two fractions $\frac{1}{8}$ and $\frac{1}{16}$ are placed between a and b such that all 4 fractions are equally placed from each other. Determine a + b.

(A) $\frac{1}{12}$ (B) $\frac{1}{9}$ (C) $\frac{3}{16}$ (D) $\frac{1}{6}$

13. Find: a x b if:

$\frac{7}{a} - \frac{3}{b} = \frac{1}{6}$; and a:b = 3:2

(A) 100 (B) 120 (C) 140 (D) 150

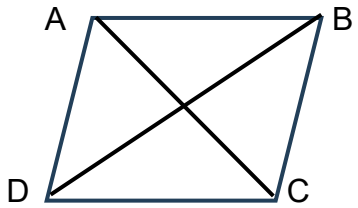
14. A car travels from Candy to Rose at an average speed of 90km/h. This car travels from Rose to Candy at an average speed of 100km/h. If the difference in the time between the 2 trips is 30 minutes then determine the distance between Candy and Rose in km.

(A) 400 (B) 450 (C) 500 (D) 540

15. An ant travels alongside a square with each side measuring 8 metres. This is done by always keeping 1 metre from the side of the square. What distance, in metres, would the ant have travelled when it returns to the original position? $\pi = \frac{22}{7}$

(A) $38\frac{1}{7}$ (B) $38\frac{4}{7}$ (C) $38\frac{2}{7}$ (D) 38

16. ABCD is a rhombus. The longer diagonal BD is 8 units more than twice the shorter diagonal. If the area of the rhombus is 480 square units then determine the perimeter of ABCD.



17. Find a+b+c if the sum is $\frac{c}{528}$.

$$\frac{1}{4x6} + \frac{1}{6x8} + \cdots . + \frac{1}{axb}$$

18. For what positive integral value of n will the following expression have the lowest positive integral value?

$$\frac{4n^2 - 8n + 6}{n - 2}$$

19. Find the value of:-

164 -160 +156 -152 +148 -.....- 16 + 12

20. The minute hand forms an angle of 60^0 with the hour hand. How long in minutes will it take for the angle to be 0^0 in the shortest possible time, if the hour hand is to the right of the minute hand?

MARKS: 1-15: 15 X 1 = 15
16-20: 5 X 2 = 10
TOTAL = 25