FEMSSISA MATHEMATICS OLYMPIAD: Grade 8 - 12

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

MATHEMATICS OLYMPIAD GRADE EIGHT

DATE: 5 AUGUST 2024 – 8 AUGUST 2024

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: 35 x 15 – 35 x 25?

   (A) -150 (B) -250 (C) -350 (D) 350

2. Determine the value of E if x = -2 where E = $2x^2 – 5x -3$

   (A) 18 (B) 15 (C) 12 (D) 9

3. Subtract:
   2x – 3y
   3x – 6y

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

4. Determine the following product:
   -2x (5x + y)

   (A) $10x^2$ - 2xy (B) $-10x^2$ - 2xy (C) $-10x^2$ + 2xy (D) -10x - 2xy

5. A recipe for a cake requires 110g of flour. How much of flour in grams will be required to bake 12 such cakes?

   (A) 1320 (B) 1300 (C) 1280 (D) 1240

6. For what values of m will this 7 digit number 111m111 is divisible by 9?

   (A) 9 (B) 6 (C) 4 (D) 3

7. If $\frac{3}{7}$ of the production in a week is 2400 items, then what is $\frac{1}{8}$ of the number of the items?

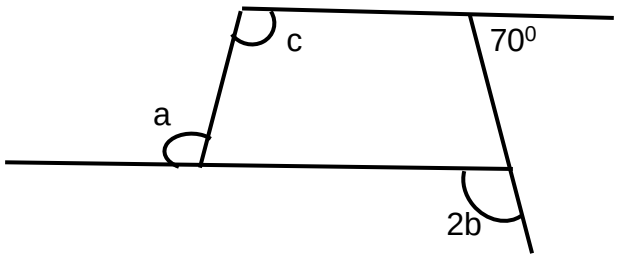
   (A) 700 (B) 640 (C) 600 (D) 560

8. Evaluate:

$$48 \times 22\frac{1}{12}$$

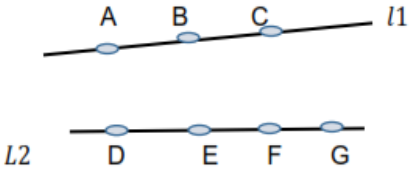
(A) 960 (B) 1020 (C) 1040 (D) 1060

9. Find the value of a+ b if a + c = 200^0 and the 3 sides of the quadrilateral are produced.



(A) 125^0 (B) 145^0 (C) 155^0 (D) 165^0

10. If one point from line 1 is joined to two points from line 2, a triangle is formed. What is the maximum number of triangles that can be formed?



(A) 18 (B) 15 (C) 12 (D) 9

11. If the difference of twice an angle's supplement and thrice its complement is 165^0 then find the angle.

(A) 72^0 (B) 75^0 (C) 80^0 (D) 84^0

12. 216 cubes measuring 1cm with all green faces are used to form one large cube. Three of the adjacent faces are painted white. These cubes were then dismantled. How many cubes now have 4 green faces?

(A) 18 (B) 16 (C) 15 (D) 12

13. Two fractions $\frac{1}{6}$ and $\frac{1}{4}$ are placed between a and b such that all 4 fractions are equally placed from each other. Determine a x b.

(A) $\frac{1}{36}$ (B) $\frac{1}{18}$ (C) $\frac{1}{9}$ (D) $\frac{1}{8}$

14. Find the following product:

$(1 - \frac{1}{4})(1 - \frac{1}{5})(1 - \frac{1}{6})(1 - \frac{1}{7})\ldots\ldots(1 - \frac{1}{38})(1 - \frac{1}{39})$

(A) $\frac{1}{39}$ (B) $\frac{4}{39}$ (C) $\frac{7}{39}$ (D) $\frac{1}{13}$

15. A bus travels from Wendywood at an average speed of 80km/h. A car travels from Wendywood at an average speed of 100km/h. If the bus left 2 hours earlier at 8am then at what time will the car overtake the bus?

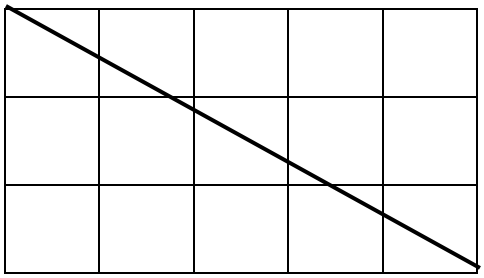
(A) 14:00 (B) 15:00 (C) 16:00 (D) 17:00

16. The minute hand forms an angle of 0^0 with the hour hand. How long in minutes will it take for the angle to be 55^0?

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

$$\frac{4n + 14}{n + 2}$$

18. A rectangle is divided into equal squares. The diagonal passes through 7 squares. If the diagonal passes through 59 squares of a 40 x n rectangle then what is area of the rectangle in square units.



19. Find the value of:-

    162 -159 +156 -153 +150 -.....- 63 + 60

20. Consider the following sequence:-

    10
    12 14
    16 18 20
    22 24 26 28
    ……..

    What is the 2nd number from the left of the 21st row?

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