

AFRICAN MATHEMATICS OLYMPIAD

...Inspiring African Champions

Junior Sec. Category

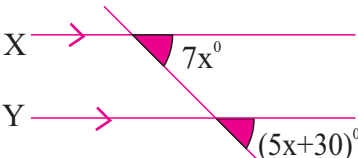
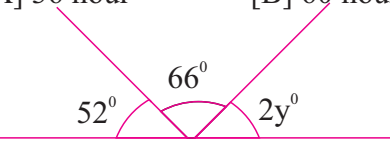
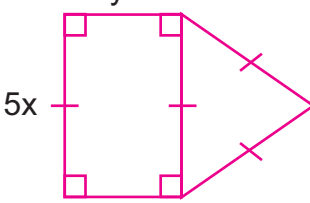
INSTRUCTION:
Attempt all questions

DURATION:
1 (ONE) HOUR

2023 Mock Examination

SECTION A

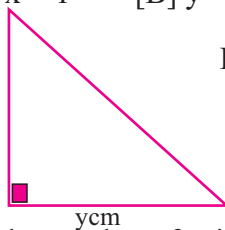
INSTRUCTION: ATTEMPT ALL QUESTIONS (EACH QUESTION CARRIES ONE MARK)

1. Mr. Okeke sold a radio set for ₦29,700 and made a profit of 10% on cost price, calculate his profit.
[A] ₦2,970 [B] ₦1,800 [C] ₦2,700 [D] ₦3,200 [E] None of the above
2.  If lines X and Y are parallel to each other, find the value of x°
[A] 10° [B] 15° [C] 25° [D] 20° [E] None of the above
3. Find the value of y if the mean of 7, 12, 4, 9 and 2y is 8
[A] 2 [B] 8 [C] 6 [D] 4 [E] None of the above
4. Three brothers shared a sum in the ratio of 3: 4: 5. If the highest got ₦37,500, how much did they share?
[A] ₦75,000 [B] ₦80,000 [C] ₦90,000 [D] ₦78,000 [E] None of the above
5. The hour hand of a clock rotates through an angle of 1080° in how many hours?
[A] 36 hour [B] 60 hours [C] 48 hours [D] 72 hours [E] None of the above
6.  Find the value of y° if PQ is a straight line.
[A] 33° [B] 62° [C] 45° [D] 31° [E] None of the above
7. The bearing of a cafe from a football field is 295° , what is the bearing of the football field from the cafe?
[A] 155° [B] 115° [C] 25° [D] 65° [E] None of the above
8. A commercial driver gave a passenger a balance of ₦1.15 instead of ₦1.25, calculate his percentage error.
[A] 8.7% [B] 10% [C] 4% [D] 8% [E] None of the above
9. Calculate the area of a rhombus whose diagonals are 12cm and 8cm long.
[A] 48cm^2 [B] 96cm^2 [C] 20cm^2 [D] 192cm^2 [E] None of the above
10. Points X and Y are 6m North and 8m East of point Z, Calculate the shortest distance between point X and Y.
[A] 25m [B] 7m [C] 10m [D] 12m [E] None of the above
11. Calculate the length of a cube of volume 729cm^3
[A] 13cm [B] 18cm [C] 16cm [D] 9cm [E] None of the above
12. The selling price of an egg is ₦8. If a dozen of egg costs ₦60, how many dozens will Mrs. Wike sell to make a profit of ₦108?
[A] 36 dozens [B] 3 dozens [C] 6 dozens [D] 12 dozens [E] None of the above
13.  Calculate the perimeter of the figure if $x = 3\text{cm}$ and $y = 2\text{cm}$
[A] 65cm [B] 80cm [C] 90cm [D] 75cm [E] None of the above
14. If the product of two consecutive even numbers is 528, find their sum.
[A] 46 [B] 50 [C] 44 [D] 54 [E] None of the above

15. X varies inversely as the square root of Y. When $X = 4$, $Y = 9$, find X when $Y = 16$.
 [A] 12 [B] 6 [C] 3 [D] 2 [E] None of the above
16. It took an airplane 8 seconds to cover a distance of 480 meters, what distance will the plane cover in 30 minutes?
 [A] 10,800m [B] 216km [C] 3,600m [D] 108km [E] None of the above
17. The probability that Bode will pass an examination is $\frac{1}{3}$ while the probability that Dele will pass the same examination is $\frac{2}{5}$. What is the probability that neither of them will pass the examination?
 [A] $\frac{2}{5}$ [B] $\frac{3}{5}$ [C] $\frac{2}{3}$ [D] $\frac{1}{3}$ [E] None of the above
18. Find the range of the following set of values $b + 4$, $b - 1$, b , $b - 2$, $b + 1$, $b - 9$, $b - 3$ and $b + 8$.
 [A] -1 [B] 17 [C] 1 [D] $2b - 1$ [E] None of the above



19. Calculate the perimeter of a semi-circle with a radius of 14cm.
 [A] 88cm [B] 44cm [C] 72cm [D] 36cm [E] None of the above
20. A rectangular field has a dimension of 12m by 2ym. If the sides are doubled, what will be the area of the new field?
 [A] $48ym^2$ [B] $96ym^2$ [C] $24y^2m^2$ [D] $48y^2m^2$ [E] None of the above
21. If 5 boys are required to fill a water drum in 90 days, how long will it take 18 boys to perform the same task assuming they are all working at the same rate?
 [A] 32 days [B] 50 days [C] 20 days [D] 25 days [E] None of the above
22. Solve the equations simultaneously $3y - 2x = -1$
 $2y + x = 4$
 [A] $y = 2, x = 1$ [B] $y = -1, x = 2$ [C] $y = 1, x = 2$ [D] $y = 1, x = -2$ [E] None of the above




23. Find the value of ycm if the area of the triangle is $108cm^2$
 [A] 6cm [B] 24cm [C] 9cm [D] 12cm [E] None of the above
24. Calculate the number of ceiling boards measuring 5cm by 10cm required to cover a square room of 5m.
 [A] 5,000 [B] 50 [C] 500 [D] 5 [E] None of the above
25. If $(2x + 10)$ and $(3x - 20)$ are complimentary angles, what is the size of the largest angle?
 [A] 20° [B] 50° [C] 70° [D] 60° [E] None of the above
26. The heights of nine electric poles in a warehouse are 24m, 31m, 52m, 19m, 41m, 29m, 37m, 53m and 45m. find the median height of the pole.
 [A] 41m [B] 29m [C] 37m [D] 52m [E] None of the above

Use the table below to answer questions 27-29

The table below shows the scores obtained by 45 students in the maiden edition of Royal Maths Olympiad.

Scores	10	9	8	7	6	5
Frequency	5	10	4	6	8	12

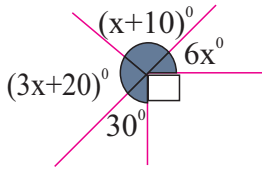
27. Estimate the mean to the nearest whole number.
 [A] 8 [B] 6 [C] 9 [D] 7 [E] None of the above
28. Find the mode of the distribution
 [A] 12 [B] 7 [C] 5 [D] 10 [E] None of the above
29. What percentage of the students scored 10 marks?
 [A] 22.2% [B] 9% [C] 11.1% [D] 7% [E] None of the above

30.  8m
 If the ratio of the shade region to the unshaded region is given as 3:2, Calculate the area of the unshaded region.
 [A] $120m^2$ [B] $48m^2$ [C] $72m^2$ [D] $24m^2$ [E] None of the above

31. If $A = 1010_{two}$ and $B = 1110_{two}$, evaluate $A + B$
 [A] 11000_{two} [B] 11100_{two} [C] 11110_{two} [D] 10100_{two} [E] None of the above
32. Find the H.C.F of $9a^2b$ and $27ab^2$
 [A] $3ab$ [B] $27ab$ [C] $6ab$ [D] $9ab$ [E] None of the above
33. Calculate the principal that would yield N9,450 after two and the half years at 10% interest per annum.
 [A] N30,000 [B] N27,000 [C] N32,000 [D] N25,000 [E] None of the above

34. A Student spent $\frac{1}{4}$ of his savings on books and $\frac{2}{3}$ on video game, what fraction will be left for refreshment?
 [A] $\frac{3}{4}$ [B] $\frac{1}{2}$ [C] $\frac{11}{12}$ [D] $\frac{1}{12}$ [E] None of the above

35



Find the value of x in the figure.

- [A] 30° [B] 21° [C] 36° [D] 10° [E] None of the above

36. Correct 0.04836 to two significant figures

- [A] 0.048 [B] 0.040 [C] 0.05 [D] 0.48 [E] None of the above

37. Michael has $18x$ books, if he lends $5x$ books to Bola and has 65 books left, how many books does he have originally? [A] 65 [B] 70 [C] 90 [D] 78 [E] None of the above

38. When a number which is 8 less than y is multiplied by 12, the result is 84, find the number.

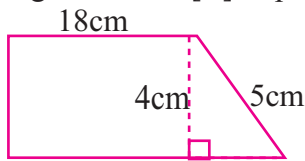
- [A] 15 [B] 10.5 [C] 9 [D] 7 [E] None of the above

39. A square and a rectangle have the same area. If the rectangle has a dimension of 3.5cm by 14cm, calculate the perimeter of the square. [A] 49cm [B] 7cm [C] 28cm [D] 14cm [E] None of the above

40. Identify the odd shape in the list.

- [A] pentagon [B] trapezium [C] parallelogram [D] rhombus [E] None of the above

41.



Calculate the area of the trapezium

- [A] 78cm^2 [B] 108cm^2 [C] 120cm^2 [D] 90cm^2 [E] None of the above

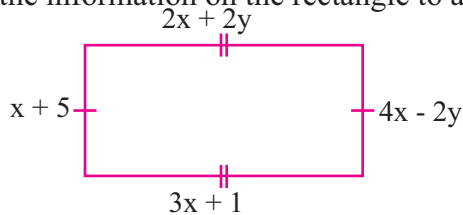
42. What is the place value of 9 in 3857.9214?

- [A] tenths [B] units [C] Thousandths [D] hundredths [E] None of the above

43. Eighteen years ago, a mother was nineteen years older than her daughter born twelve years earlier, how old was the mother last year? [A] 37 years [B] 47 years [C] 30 years [D] 48 years [E] None of the above

44. Bala scored 60 marks in a class test and got 15% of the total marks awarded. What did Ade score if he got 70% in the same test? [A] 400 marks [B] 280 marks [C] 300 marks [D] 180 marks [E] None of the above

Use the information on the rectangle to answer questions 45 and 46



45. The area of the rectangle in cm is ...

- [A] 36cm^2 [B] 108cm^2 [C] 80cm^2 [D] 64cm^2 [E] None of the above

46. Evaluate $3x - y$ in cm

- [A] 9cm [B] 6cm [C] 12cm [D] 7cm [E] None of the above

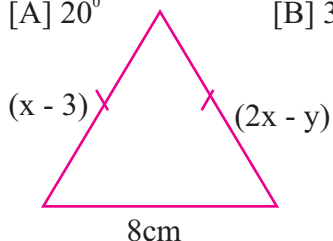
47. Express 5.5% of 15m in cm

- [A] 82.5cm [B] 82.05cm [C] 8.25cm [D] 825cm [E] None of the above

48. If $(5y + 10)^\circ$ is an acute angle, what could be the value of y ?

- [A] 20° [B] 30° [C] 15° [D] 25° [E] None of the above

49.



If the perimeter of the triangle is 32cm, find the value of x cm.

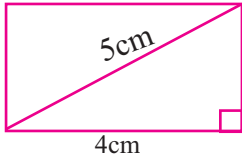
- [A] 12cm [B] 9cm [C] 24cm [D] 15cm [E] None of the above

50. The probability that a student will excel in some selected subjects in an examination is 0.28. Which of the following is not the probability that the student will pass all his exams?

- [A] 0 [B] 0.72 [C] 0.99 [D] 1.01 [E] None of the above

51. The sides of two cubes are in the ratio of 3:2, what will be the ratio of their volume?

52.



Calculate the area of the rectangle with a length of 4cm and a diagonal of 5cm.

53. What is the value of p in the sequence: 1, 5, 14, 30, 55, p, 140

54. Simplify $\frac{5}{8} \times 2\frac{1}{2} - \frac{3}{4} \div \frac{3}{5}$

55. A bowl of ice-cream and a cup of cake cost ₦11. If two bowls of Ice-cream and three cups of cake cost ₦27, how much does a cup of cake costs?

56. Simplify $(3y + 5) - (2y + 5)$

57. Calculate the sum of interior angles of an octagon

58. Change MCMXCIX to Arabic numerals

59. A piece of rod 2m long is cut into three equal pieces. One of these pieces is then cut into four equal pieces. what fraction of the total length will one of the small pieces be?

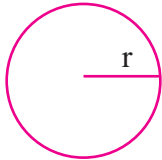
60. There are 16 boys and 14 girls in a school. If a student was absent on a particular day, find the probability that it was not a girl.

61. Evaluate $\frac{x}{x+y}$ where $x = \frac{1}{2}$ and $y = 1$

62. Convert 100011_{two} to a number in base ten.

63. Express the true bearing of 250° as a compass bearing.

64.



Calculate the radius of the circle whose circumference is 88cm

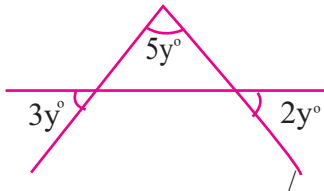
65. Make Q the subject of the relation. $\frac{1}{P} = \frac{1}{Q} + \frac{1}{R}$

66. A trader makes a loss of 15% after selling an article. Find the ratio of the selling price to cost price.

67. Calculate the size of each exterior angle of a regular pentagon.

68. A tank 50% full contains 225 litres of petrol. What percentage will be needed more to make the tank full?

69.



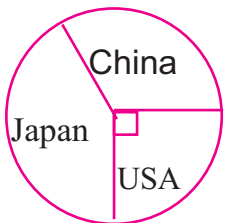
Find the value of $3y^\circ$

70 Calculate the perimeter of the quadrant of a circle with a radius of 7cm.

71. Mr Bello invested N20,000 in a commercial bank at a compound interest of 10% annually. How much will be the value of his investment at the end of the second year?

72. A cylindrical tank has a capacity of 3080m^3 , what is the depth of the tank if the diameter of its base is 14m?

73.



The pie chart shows the value of imports from different countries in tones. If 115 tones of grains were imported from USA, what was the total value of grain importation in all three countries?

74. A pilot flew for 8 hours at a certain speed, he then tripled his speed and flew for another 4 hours. Altogether he was able to cover a distance of 24,000km. Calculate his average speed in the last four hours.

75. The dimensions of a rectangular base of a right pyramid measures 9cm by 5cm. If the volume of the pyramid is 105cm^3 , how high is the pyramid?