SC 4021
WASSCE (SC) 2024
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name:.....

Index Number: 4010964016

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE) for School Candidates, 2024

SC 2024 GENERAL MATHEMATICS/MATHEMATICS (CORE) 1 $1\frac{1}{2}$ hours

OBJECTIVE TEST

[50 marks]

Do **not** *open this booklet until you are told to do so. While you are waiting, write your* **name** *and* **index number** *in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully.*

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows.
   (a) In the space marked *Name,* write in capital letters your **surname** followed by your **other names.**
   (b) In the spaces marked *Examination, Year, Subject* and *Paper,* write **'WASSCE (SC)', '2024', 'GENERAL MATHEMATICS/MATHEMATICS (CORE)'** and **'1'** respectively.
   (c) In the box marked *Index Number,* write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. **Shade** carefully the space with the same number as each digit.
   (d) In the box marked *Paper Code,* write the digits **402112** in the spaces on the left-hand side. Shade the corresponding numbered spaces in the same way as for your index number.
   (e) In the box marked *Sex,* shade the space marked **M** if you are **male**, or **F** if you are female.
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in **2** above. In the boxes marked *Index Number, Paper Code* and *Sex,* **reshade** each of the shaded spaces.
4. An example is given below. This is for a **male** candidate whose **name** is **Chinedu Oladapo DIKKO,** whose **index number** is **4251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: DIKKO CHINEDU OLADAPO (Surname / Other Names) Examination: WASSCE (SC) Year: 2024

Subject: GENERAL MATHEMATICS/MATHEMATICS (CORE) Paper: 1

INDEX NUMBER: 4 2 5 1 1 0 2 0 6 8

PAPER CODE: 4 0 2 1 1 2

SEX: Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M F

INSTRUCTIONS TO CANDIDATES
1. Use grade **HB pencil** throughout.
2. Answer each question by choosing one letter and shading it like this: [A] [B] [C]
3. Erase completely any answer(s) you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

For Supervisors only.
If candidate is absent shade this space:

025940204

Index Number: .....

Answer **all** *the questions.*

Mathematical tables may be used in any question.

The use of non-programmable, silent and cordless calculator is allowed.

Each *question is followed by* **four** *options lettered* A *to* D. *Find the correct option for* **each** *question and shade* **in pencil,** *on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to* **each** *question. An example is given below.*

The ages, in years, of **four** boys are 10, 12, 14 and 18. What is the average age of the boys?

A. 12 years

B. $12\frac{1}{2}$ years

C. 13 years

D. $13\frac{1}{2}$ years

The correct answer is $13\frac{1}{2}$ years, *which is lettered* D, *and therefore answer space* D *would be shaded.*

[A] [B] [C] [D]

Think carefully before you shade the answer spaces; erase completely **any** *answer you wish to change.*

Do **all** *rough work on this question paper.*

Now, answer the following questions.

1. Multiply 3.4×10^{-5} by 7.1×10^{8} and leave the answer in standard form.

A. 2.414×10^{2}
B. 2.414×10^{3}
C. 2.414×10^{4}
D. 2.414×10^{5}

2. Given that $P = \{p: 1 < p < 20\}$, where p is an integer} and $R = \{r: 0 \leq r \leq 25$, where r is a multiple of 4$\}$. Find $P \cap R$.

A. {4, 8, 10, 16}
B. {4, 8, 12, 16}
C. {4, 8, 12, 16, 20}
D. {4, 8, 12, 16, 20, 24}

3. The **first** term of an Arithmetic Progression (*A.P*) is 2 and the last term is 29. If the common difference is 3, how many terms are in the *A.P*?

A. 8
B. 9
C. 10
D. 11

4. Express in index form: $\log_a x + \log_a y = 3$.

A. $x + y = 3$
B. $xy = 3$
C. $x + y = a^3$
D. $xy = a^3$

Do not write in this margin

Index Number: .....

5. Simplify : $(2p - q)^2 - (p + q)^2$.

A. $3p\,(p - 2q)$
B. $2p(p - 3q)$
C. $3p(2p - q)$
D. $2p(3p - q)$

6. If $(3 - 4\sqrt{2})(1 + 3\sqrt{2}) = a + b\sqrt{2}$, find the value of b.

A. 5
B. −5
C. −21
D. 21

7. Find the time for which \$ 1,250.00 will amount to \$ 2,031.25 at 12.5 % per annum simple interest.

A. 2 years
B. 3 years
C. 4 years
D. 5 years

8. If $\log_3 (2x - 1) = 5$, find the value of x.

A. 8
B. 16
C. 64
D. 122

9. The population of a town increases by 3 % every year. In the year 2000, the population was 3,000. Find the population in the year 2003.

A. 3,182
B. 3,278
C. 6,591
D. 7,515

10. A trader gave a change of ₦540.00 instead of ₦570.00 to a customer. Calculate the percentage error.

A. $5\frac{5}{19}$ %
B. $5\frac{5}{9}$ %
C. $5\frac{7}{19}$%
D. $5\frac{7}{9}$ %

11. An interior angle of a regular polygon is 168°. Find the number of sides of the polygon.

A. 30
B. 24
C. 15
D. 12

12. If $3x - 2y = -5$ and $x + 2y = 9$, find the value of $\frac{x - y}{x + y}$.

A. $\frac{5}{3}$
B. $\frac{3}{5}$
C. $-\frac{3}{5}$
D. $-\frac{5}{3}$

Index Number:.....

Do not write in this margin

13. A variable W varies partly as M and partly inversely as P. Which of the following **correctly** represents the relation with k_1 and k_2 as constants?

A. $W = \frac{k_1 M}{k_2 P}$

B. $W = (k_1 + k_2)\frac{M}{P}$

C. $W = k_1 M + \frac{k_2}{P}$

D. $W = (k_1 + k_2)M + P$

14. A cylindrical metallic barrel of height 2.5 m and radius 0.245 m is closed at one end. Find, **correct** to **one** decimal place, the total surface area of the barrel.

[Take $\pi = \frac{22}{7}$]

A. 2.1 m^2
B. 3.5 m^2
C. 4.0 m^2
D. 9.4 m^2

15. Make R the subject of the relation $V = \pi l(R^2 - r^2)$.

A. $R = \sqrt{\frac{V}{\pi l} + r^2}$

B. $R = \sqrt{\frac{V}{\pi l} - r^2}$

C. $R = \sqrt{V - \pi l r^2}$

D. $R = \sqrt{V + \pi l r^2}$

16. Consider the following statements:

m : Edna is respectful

n : Edna is brilliant.

If $m \Rightarrow n$, which of the following is valid?

A. $\sim m \Rightarrow \sim n$
B. $n \Rightarrow \sim m$
C. $\sim n \Rightarrow \sim m$
D. $n \Rightarrow m$

17. A number is added to both the numerator and the denominator of the fraction $\frac{1}{8}$. If the result is $\frac{1}{2}$, find the number.

A. 3
B. 4
C. 5
D. 6

18. Gifty, Justina and Frank shared 60 oranges in the ratio 5 : 3 : 7 respectively. How many oranges did Justina receive?

A. 12
B. 16
C. 20
D. 28

19. Find the quadratic equation whose roots are $\frac{2}{3}$ and -1.

A. $3x^2 + x - 2 = 0$
B. $3x^2 - x - 2 = 0$
C. $3x^2 + x + 2 = 0$
D. $3x^2 + x - 1 = 0$

20. A piece of rod of length 44 m is cut to form a rectangular shape such that the ratio of the length to the breadth is 7 : 4. Find the breadth.

A. 8 m
B. 14 m
C. 16 m
D. 24 m

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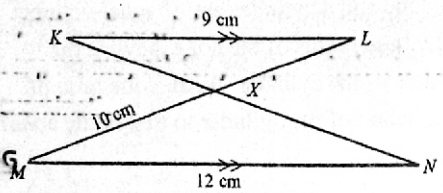
Index Number:.....

21.



NOT DRAWN TO SCALE

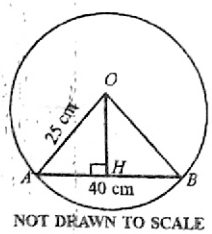
In the diagram, $\overline{MN}$ // $\overline{KL}$, $\overline{ML}$ and $\overline{KN}$ intersect at X. $|\overline{MN}| = 12$ *cm*, $|\overline{MX}| = 10$ *cm* and $|\overline{KL}| = 9$ *cm*. If the area of ΔMXN is 16 cm^2, calculate the area of ΔLXK.

A. 8 cm^2
B. 9 cm^2
C. 10 cm^2
D. 12 cm^2

22. A ladder 15 *m* long leans against a vertical pole, making an angle of 72° with the horizontal. Calculate, **correct** to **one** decimal place, the distance between the *foot of the ladder* and *the pole*.

A. 15.8 *m*
B. 14.3 *m*
C. 4.9 *m*
D. 4.6 *m*

23.



NOT DRAWN TO SCALE

In the diagram, O is the centre of the circle. If $|\overline{OA}| = 25$ *cm* and $|\overline{AB}| = 40$ *cm*, find $|\overline{OH}|$.

A. 15 *cm*
B. 20 *cm*
C. 25 *cm*
D. 30 *cm*

24. Given that P is 25 *m* on a bearing of 330° from Q, how far south of P is Q?

A. 25.2 *m*
B. 21.7 *m*
C. 19.8 *m*
D. 18.5 *m*

25. A car valued at $ 600,000.00 depreciates by 10 % **each** year. What will be the value of the car at the end of **two** years?

A. $ 120,000.00
B. $ 480,000.00
C. $ 486,000.00
D. $ 540,000.00

26. The length and breadth of a cuboid are 15 *cm* and 8 *cm* respectively. If the volume of the cuboid is 1,560 cm^3, calculate the total surface area.

A. 976 cm^2
B. 838 cm^2
C. 792 cm^2
D. 746 cm^2

27. The number 1621 was subtracted from 6244 in base x. If the result was 4323, find x.

A. Seven
B. Eight
C. Nine
D. Ten

28. Factorize completely: $27x^2 - 48y^2$.

A. $3(3x + 4y)(3x + 4y)$
B. $3(3x + 4y)(3x - 4y)$
C. $3(9x - 16y)(9x + 16y)$
D. $3(9x - 16y)(9x - 16y)$

Index Number:.....

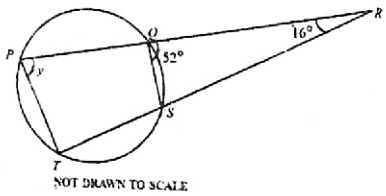
Do not write in this margin

29. For what values of x is

$$\frac{x-3}{4}+\frac{x+1}{8} \geq 2?$$

A. $x \geq 5$
B. $x \geq 6$
C. $x \geq 7$
D. $x \geq 8$

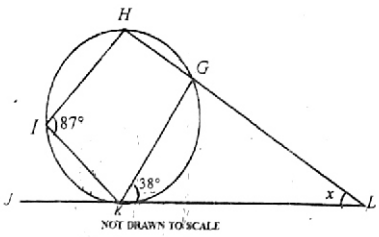
30.



In the diagram, $\angle SQR = 52°$ and $\angle PRT = 16°$. Find the value of the angle marked y.

A. 64°
B. 68°
C. 112°
D. 128°

31



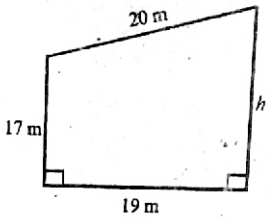
In the diagram, JKL is a tangent to the circle $GHIK$ at K, $\angle LKG = 38°$ and $\angle HIK = 87°$. Calculate the value of the angle marked x.

A. 93°
B. 55°
C. 42°
D. 23°

32. A cone and a cylinder are of equal volume. The base radius of the cone is twice the radius of the cylinder. What is the ratio of the height of the cylinder to that of the cone?

A. 5 : 4
B. 4 : 3
C. 3 : 2
D. 3 : 4

33.



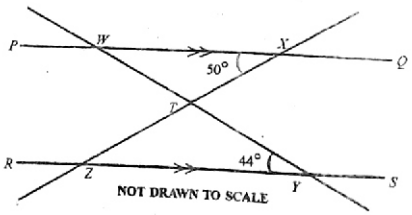
Find, correct to the **nearest** whole number, the value of h in the diagram.

A. 16 *m*
B. 22 *m*
C. 23 *m*
D. 18 *m*

34. The gradient of the line joining the points $P(2, -8)$ and $Q(1, y)$ is -4. Find the value of y.

A. 2
B. 4
C. -4
D. -3

35.



In the diagram, $\overline{PQ} // \overline{RS}$, $\angle WYZ = 44°$ and $\angle WXZ = 50°$. Find $\angle WTX$.

A. 65°
B. 68°
C. 86°
D. 90°

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Index Number:.....

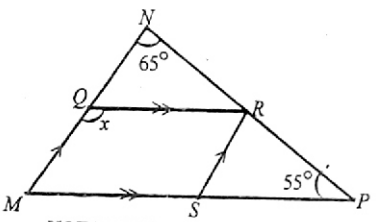
36. The perimeter of a rectangular garden is 90 *m*. If the width is 7 *m* less than the length, find the length of the garden.

A. 19 *m*
B. 23 *m*
C. 24 *m*
D. 26 *m*

37. **Four** of the angles of a hexagon sum up to 420°. If the remaining angles are equal, find the value of **each** of the angles.

A. 60°
B. 100°
C. 120°
D. 150°

38.



NOT DRAWN TO SCALE

Find the value of x in the diagram.

A. 60°
B. 65°
C. 120°
D. 125°

The following are the masses (in *kg*) of members in a club: 59, 44, 53, 57, 49, 40, 48 and 50. *Use the information to answer questions* **39** *and* **40**.

39. Calculate the mean mass.

A. 40 *kg*
B. 44 *kg*
C. 50 *kg*
D. 53 *kg*

40. Calculate the variance of the distribution.

A. 35
B. 36
C. 40
D. 50

41. **Two** opposite sides of a rectangle are $(5x + 3)$ *m* and $(2x + 9)$ *m*. If an adjacent side is $(6x - 7)$ *m*, find in m^2, the area of the rectangle.

A. 45
B. 65
C. 125
D. 165

42. A die is tossed once. Find the probability of getting a prime number.

A. $\frac{1}{2}$
B. $\frac{1}{6}$
C. $\frac{1}{3}$
D. $\frac{2}{3}$

43. The area of a sector of a circle with radius 7 *cm* is 51.3 cm^2. Calculate, correct to the **nearest** whole number, the angle of the sector.

[Take $\pi = \frac{22}{7}$]

A. 60°
B. 120°
C. 150°
D. 180°

Index Number:.....

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44. A cliff on the bank of a river is 87 *m* high. A boat on the river is 22 *m* away from the foot of the cliff. Calculate, **correct** to the **nearest** degree, the angle of depression of the boat from the top of the cliff.

A. 76°
B. 64°
C. 36°
D. 24°

45.

NOT DRAWN TO SCALE

In the diagram $\overline{TU}$ is a tangent to the circle *SPQR* at P. If $\angle PTS = 44°$ and $\angle SQP = 35°$, find $\angle PST$.

A. 101°
B. 125°
C. 130°
D. 135°

46. The probability that Amaka will pass an examination is $\frac{3}{7}$ and that Bala will pass is $\frac{4}{9}$. Find the probability that **both** will pass the examination.

A. $\frac{2}{21}$
B. $\frac{4}{21}$
C. $\frac{5}{21}$
D. $\frac{9}{21}$

47. Which of the following points lies on the line $3x - 8y = 11$?

A. (1, 1)
B. (1, −1)
C. (−1, 1)
D. (−1, −1)

48. Find the range of the following set of numbers: 28, 29, 39, 38, 33, 37, 26, 20, 15 and 25.

A. 22
B. 24
C. 25
D. 27

49. The **fourth** and **eighth** terms of an Arithmetic Progression are 16 and 40 respectively. Find the common difference.

A. −6
B. 6
C. −2
D. 2

50. For what values of y is $\frac{y+2}{8y^2 - 10y + 3}$ **not** defined?

A. $-\frac{3}{4}, -\frac{1}{2}$
B. $-\frac{3}{4}, \frac{1}{2}$
C. $\frac{3}{4}, -\frac{1}{2}$
D. $\frac{3}{4}, \frac{1}{2}$