SC402101
WASSCE 2024
GENERAL MATHEMATICS/ MATHEMATICS (CORE) 1
Objective Test
1½ hours

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THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination
for School Candidates

SC 2024 GENERAL MATHEMATICS /MATHEMATICS(CORE) 1 1½ hours

OBJECTIVE TEST

[50 marks]

Do **not** *open this booklet until you are told to do so. While you are waiting, read and observe the following instructions carefully. Write your* **name** *and* **index number** *in the spaces provided above.*

Answer **all** *the questions on your Objective Test answer sheet.*

1. Use **2B** pencil throughout.
2. On the pre-printed answer sheet, check that the following details are **correctly** printed:
   (*a*) In the space marked *Name*, check 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,* your **index number** has been printed vertically in the spaces on the left-hand side, and each numbered space has been shaded in line with each digit. **Reshade** each of the shaded spaces.
   (*d*) In the box marked *Subject Code*, the digits 402112 are printed vertically in the spaces on the left-hand side. **Reshade** the corresponding numbered spaces as you did for your index number.
3. An example is given below. This is for a male candidate whose *name* is Edem Kofi MUSAH. His *index number* is 7102143958 and she is offering *Mathematics* (*Core*) 1.

THE WEST AFRICAN EXAMINATIONS COUNCIL
ANSWER SHEET

PRINTED IN BLOCK LETTERS.
Name: MUSAH EDEM KOFI | GHA
Examination: WASSCE | Year: 2024
Subject: MATHS(CORE) | Paper: 1

INSTRUCTIONS TO CANDIDATES
1. Use grade 2B pencil throughout.
2. Answer each question by choosing one letter and shading it like this: ⊏A⊐ ⊏B⊐ ⊏C⊐ ⊏D⊐ ⊏E⊐
3. Erase completely any answer 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.

INDEX NUMBER

	0	1	2	3	4	5	6	7	8	9
7								■		
1		■								
0	■									
2			■							
1		■								
4					■					
3				■						
9										■
5						■				
8								■		

SUBJECT CODE

	0	1	2	3	4	5	6	7	8	9
4					■					
0	■									
2			■							
1		■								
1		■								
2			■							

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

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. 12½ years
C. 13 years
D. 13½ years

The correct answer is 13½ 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 answers you wish to change.

Do all rough work on this question paper.

Now answer the following questions.

1. Mr. Amuzu sold his car through an agent who charged 9 % commission on the selling price. If Amuzu received GH¢ 236,600.00 after the sale, find the selling price of the car.

A. GH¢ 260,000.00
B. GH¢ 273,000.00
C. GH¢ 238,400.00
D. GH¢ 248,000.00

2. Mr. Abban invested $1,200.00 for 3 years at 5 % per annum compound interest. Find the interest earned at the end of three years.

A. $1,380.00
B. $180.00
C. $189.15
D. $1,389.15

3. Regina is 34 years old and her daughter is 5 years. In n years, Regina will be twice as old as her daughter. Find the value of n.

A. 29
B. 24
C. 23
D. 30

4. Given the statements p and q .the statement $p \vee q$ is false only if

A. p is false and q is false.

B. p is true and q is false.

C. p is false and q is true.

D. p is true and q is true.

5. A cylindrical container closed at both ends has a radius of 3 cm and height 4 cm. What is the total surface area of the container? [Take $\pi = \frac{22}{7}$]

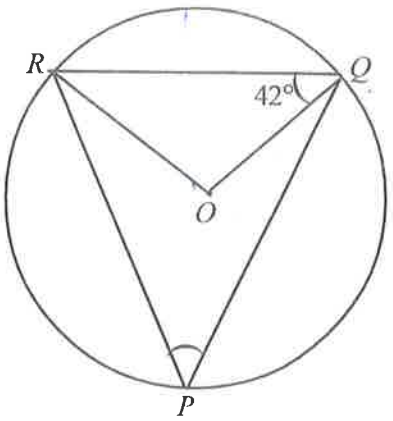
A. 125.7 cm^2

B. 113.1 cm^2

C. 103.7 cm^2

D. 132.0 cm^2

6.



NOT DRAWN TO SCALE

In the diagram PQR is a circle with centre O and $\angle OQR = 42°$. Find $\angle QPR$.

A. 54°

B 48°

C. 42°

D. 56°

7. Find the value of x for which $\frac{2x-1}{x^2+2x+1}$ is **not** defined.

A. 2

B. -1

C. $-\frac{1}{2}$

D. 1

8. The area of a square parcel of land is 256 m^2. A rectangular field of length 20 m has the same perimeter as the parcel of land. Find the area of the field.

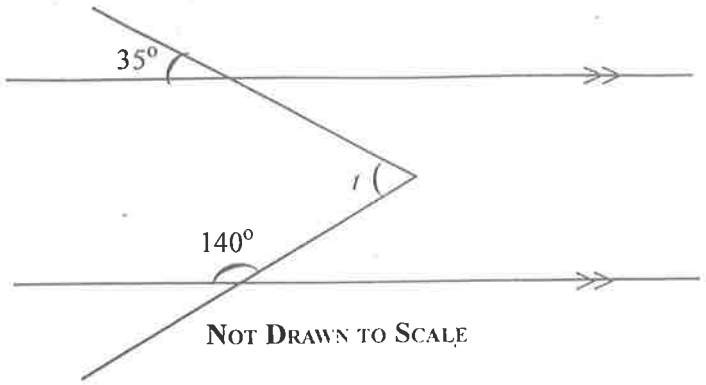
A. 320 m^2

B. 240 m^2

C. 144 m^2

D. 400 m^2

9.



NOT DRAWN TO SCALE

Calculate the value of t in the diagram.

A. 75°

B. 40°

C. 35°

D. 175°

10. The range of a sample of 10 numbers is 5 and the largest value is 50. What is the **least** value?

A. 55

B. 45

C. 40

D. 60

11. Simplify: $3 \log x + \log y - 2 \log z$.

A. $\log\left(\frac{3xy}{z^2}\right)$

B. $\log\left(\frac{x^3y}{z^2}\right)$

C. $\log(x^3yz^2)$

D. $\log\left(\frac{3xy}{2z}\right)$

12. Express 0.0063075 correct to **three** significant figures.

A. 0.00631

B. 0.0060

C. 0.006

D. 0.0063

13. A building is 12 m high. A football on the ground floor is 30 m away from the foot of the building. Find, correct to the **nearest** degree, the angle of depression of the ball from the top of the building.

A. 66^{o}

B. 24^{o}

C. 22^{o}

D. 68^{o}

14. If P ={−2, 0, 2, 4, 6} and Q ={−3, −1, 0, 2, 3, 5}, find the set P ∩ Q.

A. {−2, 4, 6}

B. {0, 2}

C. { }

D. {−3, −1 , 3, 5 }

15. If $P(-7, 8)$ is reflected in the line $x - 2 = 0$, find the coordinates of the image of P.

A. $\begin{pmatrix} 11 \\ -8 \end{pmatrix}$

B. $\begin{pmatrix} 11 \\ 8 \end{pmatrix}$

C. $\begin{pmatrix} 5 \\ 8 \end{pmatrix}$

D. $\begin{pmatrix} 8 \\ -7 \end{pmatrix}$

16. Simplify: $\dfrac{a^{-\frac{1}{4}} \times a^{\frac{1}{2}}}{a^{-\frac{1}{2}}}$

A. $a^{-\frac{1}{2}}$

B. $a^{\frac{1}{2}}$

C. $a^{\frac{3}{4}}$

D. $a^{-\frac{1}{4}}$

17. An office equipment depreciates at 15 % per annum. If the cost is GH¢ 1,200.00 when new, find the value after three years.

A. GH¢ 736.95

B. GH¢ 876.00

C. GH¢ 936.00

D. GH¢ 867.95

18. Given that $6 \otimes 7 = y$ (modulo 8), find the value of y.

A. 4

B. 3

C. 2

D. 5

19. Seven men complete a certain work schedule in 6 days. How long will it take two of the men to complete the same work schedule if they work at the same rate?

A. 21 days

B. 35 days

C. 42 days

D. 14 days

20. Given that $\sin A = \frac{3}{5}$, $0^{\circ} \leq A \leq 90^{\circ}$, find the value of $(\tan A - \cos A)$.

A. $-\frac{3}{20}$

B. $\frac{1}{20}$

C. $-\frac{1}{20}$

D. $\frac{7}{20}$

21. Find the product of 124_{seven} and 23_{seven}.

A. 3211_{seven}

B. 3115_{seven}

C. 3125_{seven}

D. 3215_{seven}

22. The diameter of a bicycle wheel is 21 cm. If the wheel makes 8 complete revolutions, what will be total distance covered by the wheel? [Take $\pi = \frac{22}{7}$]

A. 1,056 cm

B. 528 cm

C. 132 cm

D. 1, 386 cm

23. The mean of ten numbers is 16. When another number, k, is added, the mean becomes 18. Find the value of k.

A. 34

B. 36

C. 38

D. 32

24. If cos y is negative and sin y is negative, in which quadrant would y lie?

A. Third

B. Second

C. First

D. Fourth

y	1	2	3	4
x	0	2	4	6

The table describes the relation $y = mx + c$, where m and c are constants.

Use the information to answer questions **25** *and* **26**.

25. What is the gradient of the equation of the line?

A. 2

B. 1

C. $\frac{1}{2}$

D. -2

26. Find the equation of the line described in the table.

A. $y = x$

B. $y = x + 1$

C. $y = 2x$

D. $2y = x + 2$

27. If the variable P is inversely proportional to Q^2 and $P = 2.25$ when $Q = 6$, find P when $Q = 3$.

A. 8.5

B. 9.0

C. 9.5

D. 7.5

28. The interior angles of a triangle are $(y + 10)^\circ$, $(2y - 40)^\circ$ and $(3y - 90)^\circ$. Which of the following accurately describes the triangle?

A. equilateral triangle

B. scalene triangle

C. isosceles triangle

D. right-angled triangle

29. The diagonals of a rhombus are 12 cm and 16 cm. Find the perimeter.

A. 28 cm

B. 40 cm

C. 42 cm

D. 24 cm

30. The sum of the interior angles of a polygon is 1260°. Find the number of sides.

A. 7

B. 8

C. 9

D. 6

31. Solve: $\frac{x-2}{4} - \frac{2x-4}{3} = \frac{5}{6}$.

A. $x = 4$

B. $x = 2$

C. $x = 0$

D. $x = 5$

32. Solve: $x(3x + 4) = 4$.

A. $x = \frac{2}{3}$ or $x = 2$

B. $x = -\frac{2}{3}$ or $x = -2$

C. $x = \frac{2}{3}$ or $x = -2$

D. $x = -\frac{2}{3}$ or $x = 2$

33. A closed cuboid has length 12 cm, width 7 cm and height 5 cm. Calculate the total surface area.

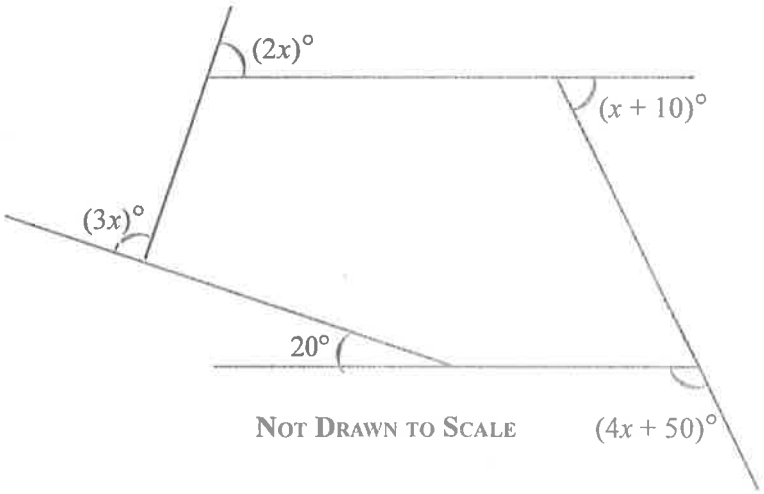
A. 358 cm^2

B. 210 cm^2

C. 179 cm^2

D. 420 cm^2

34.



NOT DRAWN TO SCALE

Find the value of x in the diagram.

A. 36

B. 28

C. 16

D. 44

35. Three boys of ages 2, 4 , and 10 shared 32 oranges in the ratio of their ages. What was the **least** share?

A. 8

B. 6

C. 4

D. 10

36. Make x the subject of the relation $y = \sqrt{\frac{px}{r} - r^2 x}$

A. $x = \frac{ry}{p - r^3}$

B. $x = \frac{y^2}{p - r^2}$

C. $x = \frac{ry^2}{p - r^3}$

D. $x = \frac{p - r^3}{ry^2}$

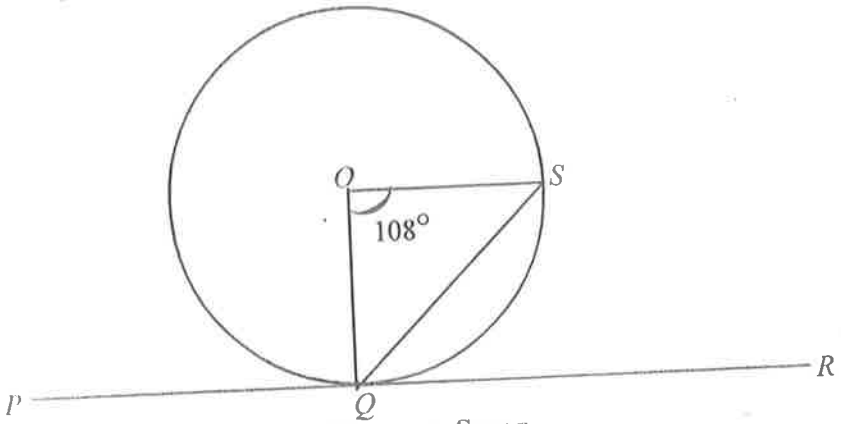
37. A number is chosen at random from the set {13, 14, ..., 30}. What is the probability that it is a prime number?

A. $\frac{5}{18}$

B. $\frac{3}{8}$

C. $\frac{5}{16}$

D. $\frac{1}{3}$



NOT DRAWN TO SCALE

In the diagram $\overline{PR}$ is tangent to the circle at Q. The centre of the circle is O and $\angle QOS = 108°$.

Use the information to answer questions **38** *and* **39**.

38. Find $\angle$ OSQ.

A. $36°$

B. $42°$

C. $72°$

D. $18°$

39. Find $\angle$ SQR.

A. 54°

B. 42°

C. 36°

D. 72°

40. The volume of a cone is 264 cm^3. If the base radius is 6 cm, find the height. [Take $\pi = \frac{22}{7}$]

A. 7 cm

B. 6 cm

C. 5 cm

D. 8 cm

41. The second term of a Geometric Progression (G.P) is 9. If the fourth term is 81, find the common ratio.

A. 2

B. 3

C. 4

D. 1

42. Given that $m = 5$, $n = 3$ and $r = 2$, evaluate $\frac{(m^2 - n^2) + r^2}{m^2 + (n^2 - r^2)}$.

A. 1

B. $\frac{2}{3}$

C. $\frac{1}{3}$

D. $\frac{4}{3}$

43. The probabilities that John and James pass an examination are $\frac{3}{4}$ and $\frac{3}{5}$ respectively. Find the probability that **both** will fail.

A. $\frac{9}{20}$

B. $\frac{3}{10}$

C. $\frac{1}{10}$

D. $\frac{11}{20}$

In an examination taken by 120 students, 90 passed Mathematics, 40 passed Science and 5 failed both subjects. *Use the information to answer questions* **44** *and* **45**.

44. How many students passed Science **only**?

A. 25
B. 20
C. 15
D. 75

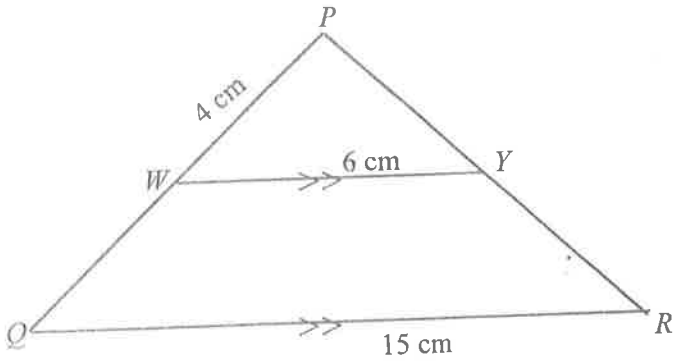
45. Find the probability that a student selected at random passed **only** one subject.

A. $\frac{5}{6}$
B. $\frac{7}{24}$
C. $\frac{1}{6}$
D. $\frac{19}{24}$

46 Find the value of x that satisfies the equation: $\frac{2}{3}(x+5) = 1 - \frac{x-7}{2}$.

A. 3
B. 2
C. 1
D. 4

47.



NOT DRAWN TO SCALE

In the diagram, ΔPQR is similar to ΔPWY. $\overline{WY} \parallel \overline{QR}$, $|\overline{QR}| = 15$ cm, $|\overline{WY}| = 6$ cm and $|\overline{WP}| = 4$ cm. Find $|\overline{WQ}|$.

A. 10 cm
B. 8 cm
C. 6 cm
D. 12 cm

48. If $2x + 3y = 18$ and $4x + 5y = 32$, find the value of $(2x - y)$.

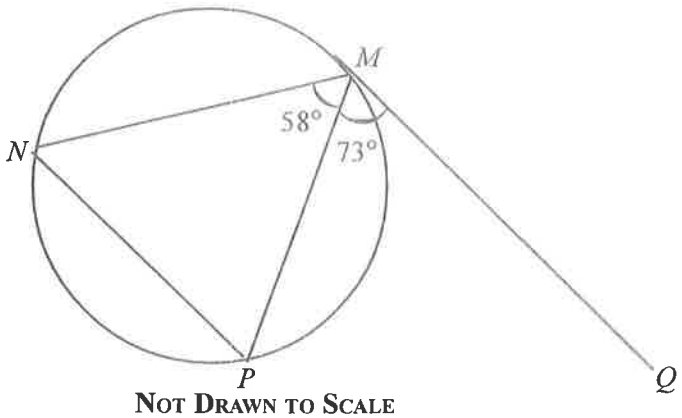
A. 2

B. 3

C. 4

D. 1

49.



NOT DRAWN TO SCALE

The diagram shows a triangle MNP inscribed in a circle. $\overline{MQ}$ is a tangent to the circle at M. Find $\angle MPN$.

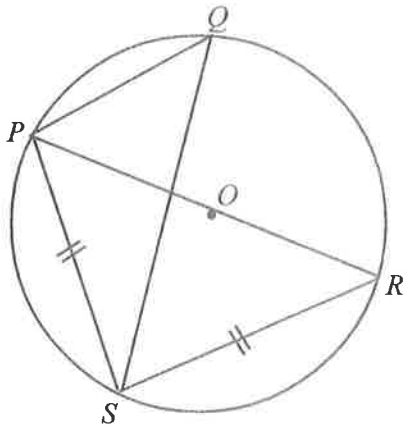
A. 73°

B. 58°

C. 49°

D. 131°

50.



NOT DRAWN TO SCALE

In the diagram, $\overline{PR}$ is a diameter of the circle $PQRS$ with centre O. Find the value of $\angle PQS$.

A. 55°

B. 45°

C. 37°

D. 90°

END OF PAPER