

SC4021
WASSCE 2018
MATHEMATICS (CORE) 1
Objective Test
1½ hours

1

THE WEST AFRICAN EXAMINATIONS COUNCIL
West African Senior School Certificate Examination
for School Candidates

SC 2018

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.

- Use 2B pencil throughout.
- On the pre-printed answer sheet, check that the following details are correctly printed:
 - In the space marked *Name*, check your **surname** followed by your **other names**.
 - In the spaces marked *Examination*, *Year*, *Subject* and *Paper*, check 'WASSCE', 'SC 2018', 'MATHEMATICS (CORE)', and '1' in that order.
 - 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.
 - 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.
- An example is given below. This is for a female candidate whose *name* is *Aba Kokui USMAN*. Her *index number* is 7102143958 and she is offering *Mathematics (Core) 1*.

THE WEST AFRICAN EXAMINATIONS COUNCIL
ANSWER SHEET

PRINTED IN BLOCK LETTERS.		GHA	
Name: USMAN ABA KOKUI			
Examination: WASSCE		Year: SC 2018	
Subject: MATHEMATICS (CORE)		Paper: 1	

INSTRUCTIONS TO CANDIDATES

- Use grade 2B pencil throughout.
- Answer each question by choosing one letter and shading it like this: A B C D E
- Erase completely any answer you wish to change.
- Leave extra spaces blank if the answer spaces provided are more than you need.
- Do not make any markings across the heavy black marks at the right hand edge of your answer sheet.

INDEX NUMBER										SUBJECT CODE											
7	0	1	2	3	4	5	6	7	8	9	4	0	1	2	3	4	5	6	7	8	9
1	0	1	2	3	4	5	6	7	8	9	0	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9
2	0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9
1	0	1	2	3	4	5	6	7	8	9	1	0	1	2	3	4	5	6	7	8	9
4	0	1	2	3	4	5	6	7	8	9	2	0	1	2	3	4	5	6	7	8	9
3	0	1	2	3	4	5	6	7	8	9	For Supervisors only If candidate is absent shade this space. <input type="checkbox"/>										
9	0	1	2	3	4	5	6	7	8	9											
5	0	1	2	3	4	5	6	7	8	9											
8	0	1	2	3	4	5	6	7	8	9											

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

E

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.

Simplify: $\frac{\frac{1}{4} \times 2\frac{1}{2}}{12 \div 1\frac{1}{2}}$

- A. $\frac{5}{8}$
- B. $\frac{5}{32}$
- C. $\frac{5}{64}$
- D. $\frac{5}{72}$

2. Given that $3 \times 9^{1+x} = 27^{-x}$, find the value of x .

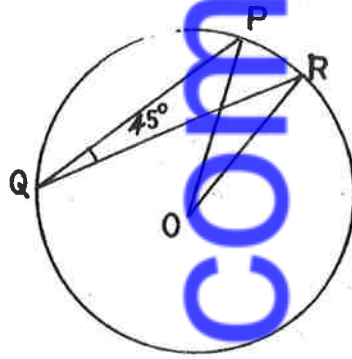
- A. $-\frac{3}{5}$
- B. $-1\frac{2}{3}$
- C. -2
- D. -3

3. In a class of 39 students, 25 offer Fante and 19 offer Twi. Five students do not offer any of the two languages. How many students offer only Twi?
- A. 6
B. 7
C. 8
D. 9
4. Evaluate: $\frac{4-\sqrt{2}}{\sqrt{2}}$.
- A. $\sqrt{2}-1$
B. $2\sqrt{2}-1$
C. $\sqrt{2}+1$
D. $2\sqrt{2}+1$
5. Mary and Charity entered into a business partnership and agreed to share their profit in the ratio 4 : 5 respectively. If Mary received GH¢ 5,000.00 less than Charity, how much profit did they make?
- A. GH¢30,000.00
B. GH¢35,000.00
C. GH¢40,000.00
D. GH¢45,000.00
6. A man bought a car which costs ₵5,000,000.00 from a dealer on hire purchase. He pays a deposit of ₵3,000,000.00 and agrees to pay the balance at 8% compound interest per annum. If he pays ₵1,000,000.00 at the end of each year, how much will be remaining to be paid after two years?
- A. ₵ 92,800.00
B. ₵ 252,800.00
C. ₵ 320,000.00
D. ₵ 332,800.00
7. y varies inversely as the square of x . When $x = 3$, $y = 100$. Find the value of x when $y = 25$.
- A. $x = 30$
B. $x = 12$
C. $x = 6$
D. $x = 5$
8. Solve the equation: $t - \frac{9}{5} = -1\frac{1}{15}$.
- A. $t = \frac{3}{5}$
B. $t = \frac{11}{15}$
C. $t = \frac{4}{5}$
D. $t = \frac{13}{15}$
9. Find the truth set of the equation: $(x-2)^2 + 3 = (x+1)^2 - 6$.
- A. $\{-2\}$
B. $\{-1\}$
C. $\{1\}$
D. $\{2\}$

10. Two friends, Dede and Kofi decided to buy the same type of car. They found out that the car cost ₦3,000,000.00. The amount of money (f) which Dede had was not enough to buy the car but Kofi had enough money (k) to buy the car. Which of the following inequalities is true?
- A. $f \leq \text{₦}3,000,000.00 \leq k$
 B. $f > \text{₦}3,000,000.00 > k$
 C. $f < \text{₦}3,000,000.00 \leq k$
 D. $f \geq \text{₦}3,000,000.00 > k$
11. Simplify: $\frac{z}{z+2} - \frac{z-2}{z-3}$.
- A. $\frac{4-3z}{(z+2)(z-3)}$
 B. $\frac{3z-4}{(z-3)(z+2)}$
 C. $\frac{4+3z}{(z+3)(z-2)}$
 D. $\frac{4+3z}{(z+2)(z-3)}$
12. Simplify: $\frac{x^{-1} + y^{-1}}{x + y}$.
- A. $\frac{y}{x}$
 B. $\frac{x}{y}$
 C. $\frac{1}{xy}$
 D. xy
13. A chord of a circle with radius 5 cm subtends an angle of 70° at the centre. Find, correct to **one** decimal place, the length of the chord.
- A. 8.2 cm
 B. 5.7 cm
 C. 4.1 cm
 D. 2.9 cm
14. A pyramid with a square base has a volume of $1,400 \text{ cm}^3$. If a side of the base is 10 cm long, find the height of the pyramid.
- A. 70 cm
 B. 42 cm
 C. 21 cm
 D. 7 cm

15.

5



NOT DRAWN TO SCALE

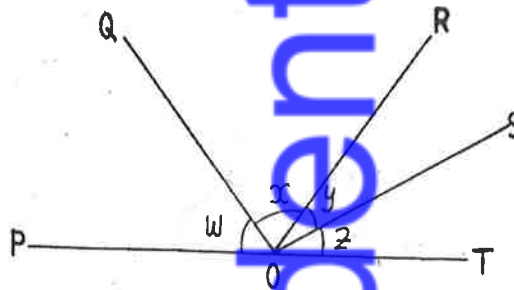
In the diagram, O is the centre of the circle. If the radius of the circle is 12 cm and $\angle PQR = 45^\circ$, calculate, correct to the nearest cm, the length of arc PR . [Take $\pi = \frac{22}{7}$]

- A. 113 cm
- B. 57 cm
- C. 19 cm
- D. 15 cm

16. Which of the following about parallelograms is true?

- A. Opposite angles are supplementary
- B. Opposite angles are complementary
- C. Opposite angles are equal
- D. Opposite angles are reflex angles

17.



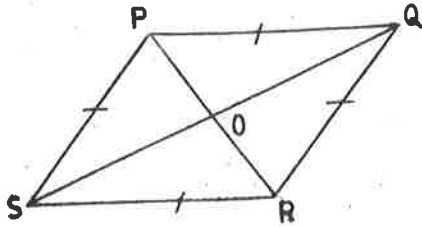
In the diagram, POT is a straight line. If $(w + x + y) = 140^\circ$ and $(x + y + z) = 130^\circ$, find the value of $(x + y)$.

- A. 40°
- B. 50°
- C. 90°
- D. 110°

Turn over

18. The interior angles of a pentagon are x° , $(x + 5)^\circ$, $(x + 10)^\circ$, $(x + 15)^\circ$, and $(x + 20)^\circ$. Find the value of x .
- A. 98
 B. 88
 C. 78
 D. 68

19.



NOT DRAWN TO SCALE

The diagram shows a rhombus $PQRS$ with diagonals intersecting at O . If the ratio of $\angle PQR$ to $\angle QPS$ is $3 : 7$, calculate the value of $\angle QSR$.

- A. 27°
 B. 45°
 C. 54°
 D. 63°
20. Calculate the gradient of the line which passes through the points $(1, 4)$ and $(-2, 6)$.
- A. $-\frac{3}{2}$
 B. $-\frac{2}{3}$
 C. $\frac{2}{3}$
 D. $\frac{3}{2}$
21. Calculate the distance between points $(3, -2)$ and $(8, 10)$.
- A. 12 units
 B. 13 units
 C. 14 units
 D. 15 units
22. Evaluate: $\frac{\cos 65^\circ}{\sin 25^\circ} + \frac{\sin 35^\circ}{\cos 55^\circ}$.
- A. 3
 B. 2
 C. 1
 D. 0

23. From a height of 2 m above the ground and at a horizontal distance of $12\sqrt{3}$ m from a tree, the angle of elevation of the top of the tree is 30° . How tall is the tree?
- A. 8 m
 B. $8\sqrt{3}$ m
 C. 14 m
 D. 18 m
24. Express the bearing of 312° in compass direction form.
- A. S 48° W
 B. N 48° W
 C. S 48° E
 D. N 48° E
25. A fair die is thrown once. What is the probability of obtaining 3?
- A. $\frac{1}{6}$
 B. $\frac{1}{3}$
 C. $\frac{1}{2}$
 D. 1

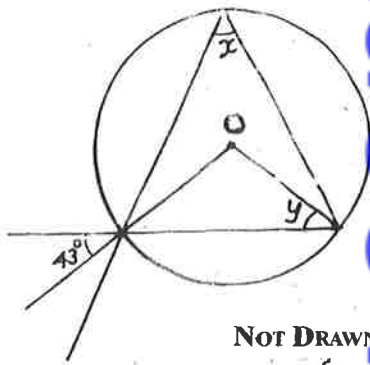
The table shows the distribution of the ages of members of a school choir. Use the table to answer questions 26 and 27.

Age(years)	15	16	17	18
No. of students	5	6	3	1

26. Calculate the mean age.
- A. 15 years
 B. 16 years
 C. 17 years
 D. 18 years
27. Find the median age.
- A. $15\frac{1}{2}$ years
 B. 16 years
 C. $16\frac{1}{2}$ years
 D. 17 years

28. If $x = \frac{mn}{3}$ and $m = \frac{v}{y}$, express x in terms of v , y and n .
- A. $x = \frac{3vy}{n}$
- B. $x = \frac{vy}{3n}$
- C. $x = \frac{vyn}{3}$
- D. $x = \frac{vn}{3y}$
29. If $M_{\text{six}} = 123_{\text{five}}$, find the value of M .
- A. 53
- B. 55
- C. 62
- D. 102
30. In triangle XYZ , $|XY| = 8$ cm and Z is equidistant from X and Y . If Z is 5 cm from X , find the area of the triangle.
- A. 24 cm^2
- B. 18 cm^2
- C. 12 cm^2
- D. 10 cm^2
31. Calculate the total surface area of a cuboid whose dimensions are 12 cm x 8 cm x 3 cm.
- A. 96 cm^2
- B. 156 cm^2
- C. 288 cm^2
- D. 312 cm^2
32. Calculate, correct to the nearest whole number, the volume of a sphere with diameter 6 cm.
[Take $\pi = \frac{22}{7}$]
- A. 15 cm^3
- B. 36 cm^3
- C. 113 cm^3
- D. 124 cm^3

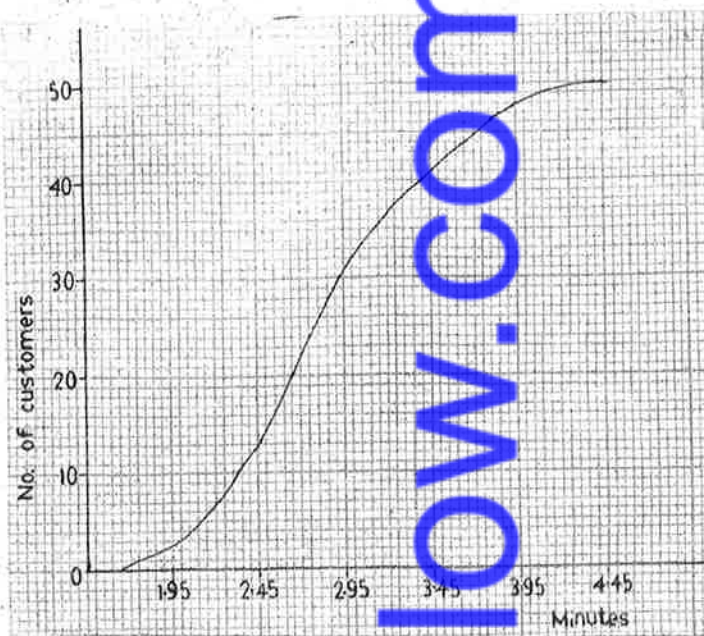
The diagram shows a circle centre O . Use it to answer questions 33 and 34.



NOT DRAWN TO SCALE

33. Find the value of y .
- A. 43°
 B. 47°
 C. 54°
 D. 86°
34. Find the value of x .
- A. 43°
 B. 47°
 C. 54°
 D. 89°
35. Find the n th term of the Geometric Progression (G.P.): $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$
- A. 2^{n-1}
 B. 2^n
 C. $\frac{1}{2^n}$
 D. $\frac{1}{2^{n-1}}$
36. An old man goes for a walk every 6 days. If he went for a walk on Wednesday, when will he go for the next walk?
- A. Monday
 B. Tuesday
 C. Wednesday
 D. Thursday

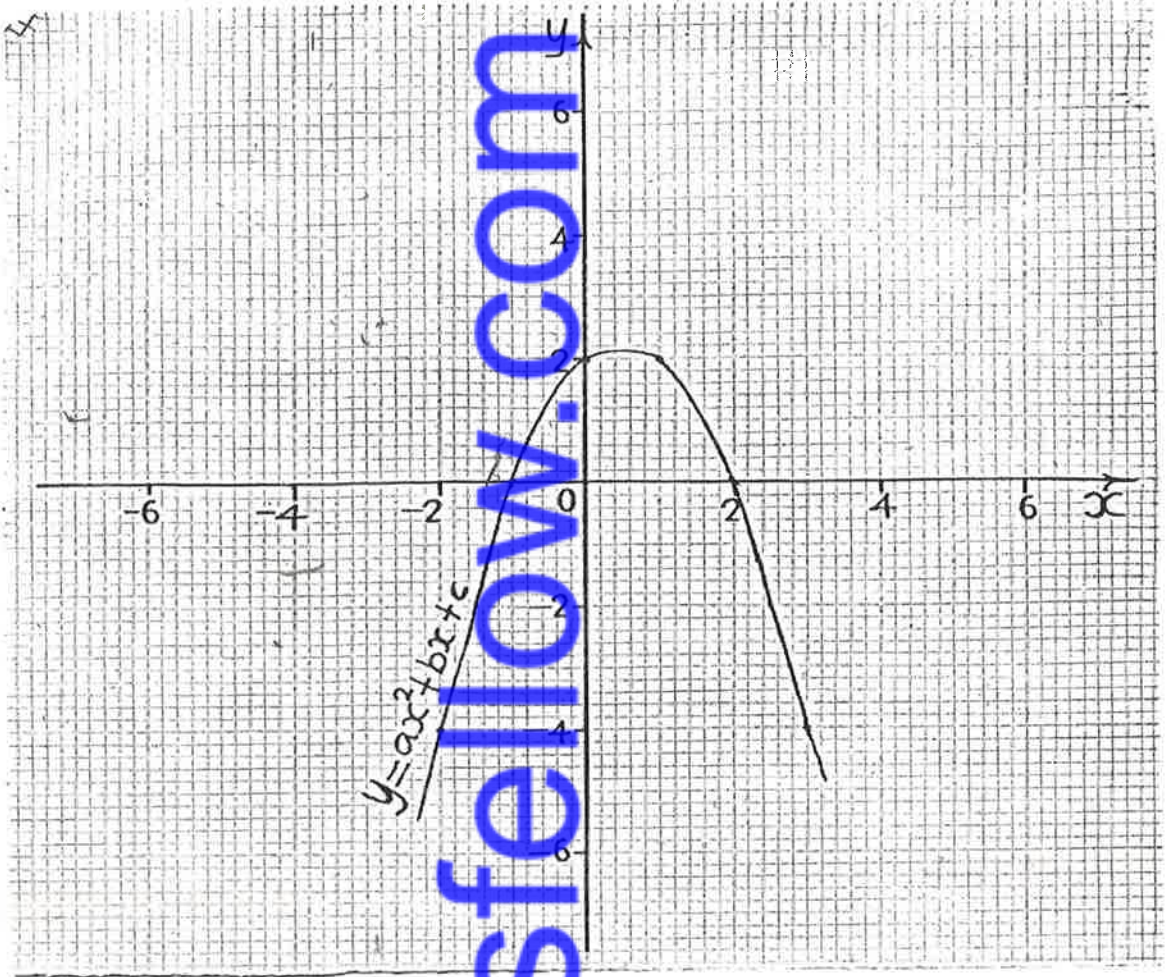
The cumulative frequency curve (Ogive) shows the distribution of waiting time of some customers at a filling station. Use the curve to answer questions 37 and 38.



37. Estimate the interquartile range.
- A. 0.70
B. 0.75
C. 0.80
D. 0.85
38. How many customers waited for **at least** 3 minutes?
- A. 16
B. 17
C. 18
D. 19
39. What is the coefficient of x in the expansion of $(4x^2 + 3x - 1)(3x + 1)$?
- A. -1
B. 0
C. 1
D. 2
40. Find the quadratic equation whose roots are $\frac{1}{2}$ and $-\frac{3}{2}$.
- A. $x^2 + 4x - 3 = 0$
B. $4x^2 + x - 3 = 0$
C. $x^2 - 4x - 3 = 0$
D. $4x^2 + 4x - 3 = 0$

41. Two times a number added to one-third of the number gives $5\frac{1}{6}$. Find the number.
- A. $2\frac{2}{7}$
B. $2\frac{3}{14}$
C. $2\frac{1}{7}$
D. $2\frac{1}{14}$
42. Find the mean deviation of 5, 8, 3, 7, 2.
- A. 0
B. 2
C. 5
D. 10
43. In a certain community, 1 out of every 8 persons is a graduate. If Yomi and Etteh are members of the community, what is the probability that they are both graduates?
- A. $\frac{1}{64}$
B. $\frac{1}{16}$
C. $\frac{1}{8}$
D. $\frac{1}{4}$
44. Which of the following statements is false?
- A. In a circle, equal chords subtend equal angles at the centre
B. The length of an arc is proportional to the angle subtended by the arc at the centre of the circle
C. The circumference of a circle is directly proportional to its diameter
D. The angle between the tangent to a circle and its radius is complementary

45



Find the equation of the graph in the diagram.

- A. $y = 2 - x - x^2$
- B. $y = 2 - x + x^2$
- C. $y = 2 + x - x^2$
- D. $y = 2 + x + x^2$

46. If $\log x = 0.3030$, $\log y = 0.4771$ and $\log Z = 0.8451$, evaluate: $\frac{\log x - \log Z^{\frac{1}{3}}}{\log y^3}$.
- A. 1.4313
 - B. 0.8466
 - C. 0.5466
 - D. 0.0149

47. Consider these two statements:

P : n is an odd number;

Q : n is a prime number greater than 2.

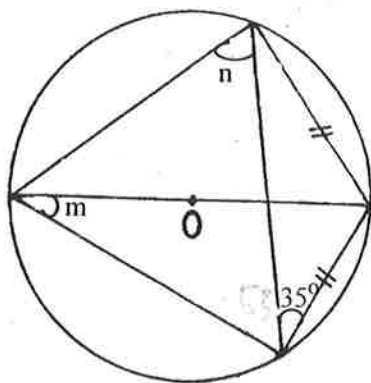
Express "If n is not an odd number then n is not a prime number greater than 2" in symbolic form.

- A. $\sim P \wedge \sim Q$
- B. $\sim P \Rightarrow Q$
- C. $P \Rightarrow \sim Q$
- D. $\sim P \Rightarrow \sim Q$

48. Which of the following is **not** a rational number?

- A. -5
- B. $\sqrt{4}$
- C. $3\frac{3}{4}$
- D. $\sqrt{90}$

Use the diagram to answer questions 49 and 50.



NOT DRAWN TO SCALE

49. Find the value of m .

- A. 35°
- B. 45°
- C. 65°
- D. 75°

50. Find the value of n .

- A. 70°
- B. 65°
- C. 55°
- D. 35°

END OF PAPER