S4021 June
WASSCE 2013
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name: Heador Nonuwe

Index Number: 2081002227

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination

June 2013 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', '2013 JUNE', '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 **Chukwuma Adekunle CIROMA,** whose **index number** is **4251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: CIROMA (Surname) CHUKWUMA ADEKUNLE (Other Names) Examination: WASSCE Year: 2013 JUNE

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

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

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

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 answers 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.

1026

Answer **all** *the questions.*

Mathem*atical 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 out 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] [■]

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 2.7×10^{-4} by 6.3×10^{6} and leave your answer in standard form.

A. 1.7×10^{3}

B. 1.70×10^{3}

C. 1.701×10^{3}

D. 17.01×10^{3}

2. If $9^{(2-x)} = 3$, find x.

A. 1

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

C. 2

D. $\frac{5}{2}$

3. In what number base is the addition $465 + 24 + 225 = 1050$?

A. ten

B. nine

C. eight

D. seven

4. Simplify: $\dfrac{1\frac{7}{8} \times 2\frac{2}{5}}{6\frac{3}{4} \div \frac{3}{4}}$

A. 9

B. $4\frac{1}{2}$

C. 2

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

5. If $U_n = n(n^2 + 1)$, evaluate $U_5 - U_4$.

A. 18

B. 56

C. 62

D. 80

6. If $\sqrt{50} - K\sqrt{8} = \frac{2}{\sqrt{2}}$, find K.

A. –2

B. –1

C. 1

D. 2

7. A sales boy gave a change of N68 instead of N72. Calculate his percentage error.

A. 4 %

B. $5\frac{5}{9}\%$

C. $5\frac{15}{17}\%$

D. 7 %

8. Four oranges sell for Nx and three mangoes sell for Ny. Olu bought 24 oranges and 12 mangoes. How much did he pay in terms of x and y?

A. N$(4x + 6y)$

B. N$(6x + 4y)$

C. N$(24x + 12y)$

D. N$(12x + 24y)$

9. Simplify: $\frac{x^2 - y^2}{(x+y)^2} \div \frac{(x-y)^2}{(3x+3y)}$.

A. $\frac{x-y}{3}$

B. $x + y$

C. $\frac{3}{x-y}$

D. $x - y$

10. Solve the inequality: $\frac{2x-5}{2} < (2-x)$.

A. $x > 0$

B. $x < \frac{1}{4}$

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

D. $x < 2\frac{1}{4}$

11. If $x = 64$ and $y = 27$, evaluate: $\frac{x^{\frac{1}{2}} - y^{\frac{1}{3}}}{y - x^{\frac{2}{3}}}$.

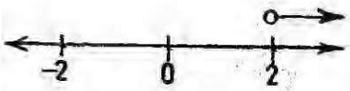
A. $2\frac{1}{5}$

B. 1

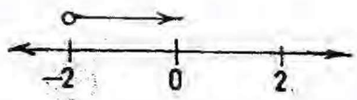
C. $\frac{5}{11}$

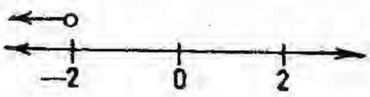
D. $\frac{11}{43}$

12. Which of the following lines represents the solution of the inequality $7x < 9x - 4$?

A. 

B. 

C. 

D. 

13. If $\frac{1}{2}x + 2y = 3$ and $\frac{3}{2}x - 2y = 1$, find $(x + y)$.

A. 3

B. 2

C. 1

D. 0

14. Given that $p^{\frac{1}{3}} = \frac{\sqrt[3]{q}}{r}$, make q the subject of the equation.

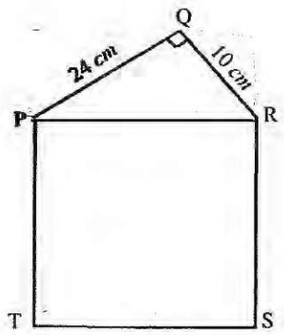
A. $q = p\sqrt{r}$

B. $q = p^3r$

C. $q = pr^3$

D. $q = pr^{\frac{1}{3}}$

15.



In the diagram, $PRST$ is a square. If $|PQ| = 24\ cm$, $|QR| = 10\ cm$ and $\angle PQR = 90°$; find the perimeter of the polygon $PQRST$.

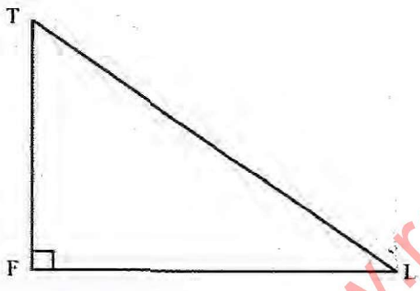
A. 112 *cm*

B. 98 *cm*

C. 86 *cm*

D. 84 *cm*

16.



In the diagram, the height of a flagpole $|TF|$ and the length of its shadow $|FL|$ are in the ratio 6 : 8. Using K as a constant of proportionality, find the shortest distance between T and L.

A. 7*K units*

B. 10*K units*

C. 12*K units*

D. 14*K units*

17. A chord is 2 *cm* from the centre of a circle. If the radius of the circle is 5 *cm*, find the length of the chord.

A. $2\sqrt{21}$ *cm*

B. $\sqrt{42}$ *cm*

C. $2\sqrt{19}$ *cm*

D. $\sqrt{21}$ *cm*

18. A cube and a cuboid have the same base area. The volume of the cube is 64 cm^3 while that of the cuboid is 80 cm^3. Find the height of the cuboid.

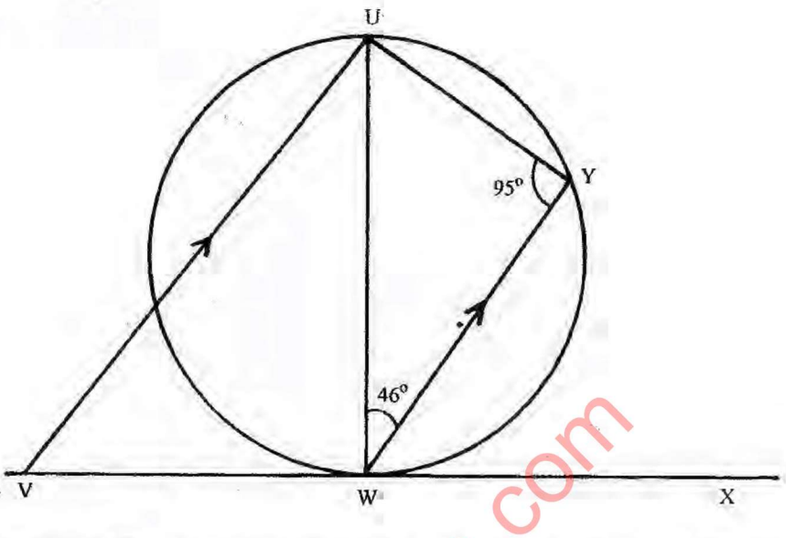
A. 2 *cm*

B. 3 *cm*

C. 5 *cm*

D. 6 *cm*

19.



In the diagram, $\overline{VX}$ is a tangent to the circle UYW at W. If $WY//UV$, $\angle UYW = 95°$ and $\angle UWY = 46°$, find $\angle UVW$.

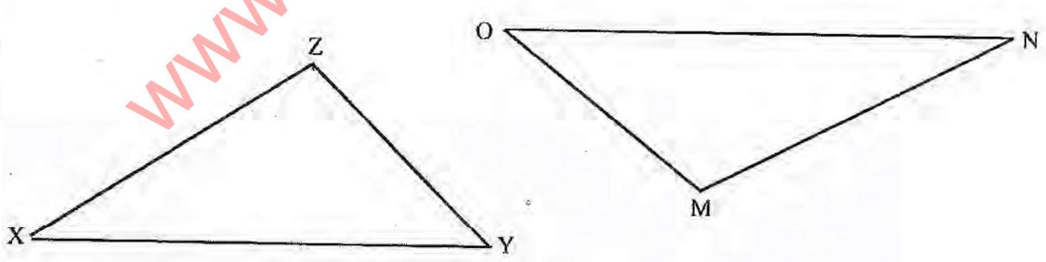
A. 51°

B. 49°

C. 39°

D. 34°

20.



In the diagrams, $|XZ| = |MN|$, $|ZY| = |MO|$ and $|XY| = |NO|$. Which of the following statements is true?

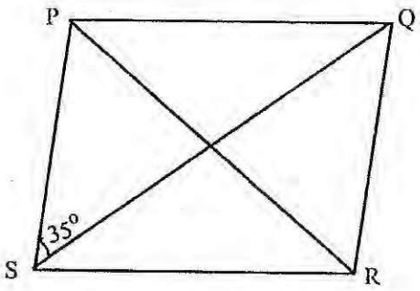
A. $\Delta ZYX \equiv \Delta OMN$

B. $\Delta YZX \equiv \Delta NOM$

C. $\Delta ZXY \equiv \Delta MON$

D. $\Delta XYZ \equiv \Delta NOM$

21.



In the diagram, $PQRS$ is a rhombus and $\angle PSQ = 35°$. Calculate the size of $\angle PRQ$.

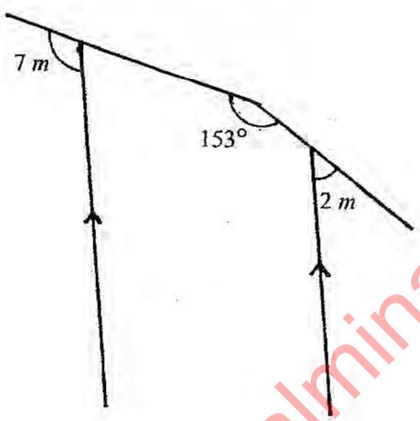
A. 65°

B. 55°

C. 45°

D. 35°

22.



Find the value of m in the diagram.

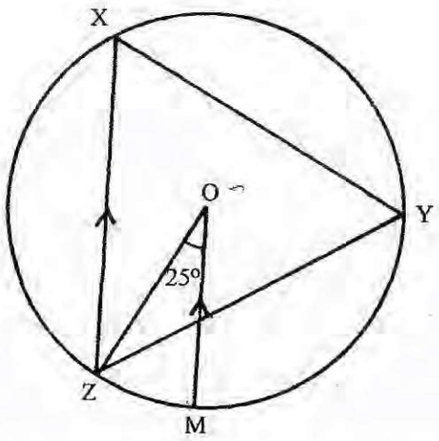
A. 34°

B. 27°

C. 23°

D. 17°

23.



In the diagram, O is the centre of the circle, $OM \parallel XZ$ and $\angle ZOM = 25°$. Calculate $\angle XYZ$.

A. 50°

B. 55°

C. 60°

D. 65°

24. If $\sin x = \frac{5}{13}$ and $0° \leq x \leq 90°$, find the value of $(\cos x - \tan x)$.

A. $\frac{7}{13}$

B. $\frac{12}{13}$

C. $\frac{79}{156}$

D. $\frac{209}{156}$

25. An object is 6 m away from the base of a mast. The angle of depression of the object from the top of the mast is 50°. Find, correct to 2 decimal places, the height of the mast.

A. 8.60 m

B. 7.51 m

C. 7.15 m

D. 1.19 m

26. The bearing of Y from X is 060° and the bearing of Z from $Y = 060°$. Find the bearing of X from Z.

A. 300°

B. 240°

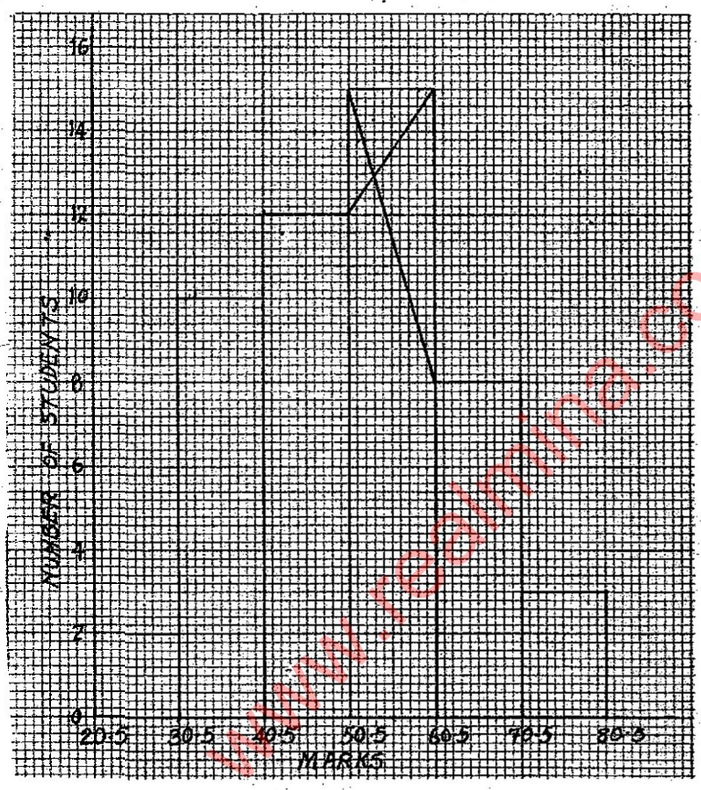
C. 180°

D. 120°

Turn over

27. Which of the following is **not** a probability of Mary scoring 85% in a mathematics test?

A. 0.15
B. 0.57
C. 0.94
D. 1.01



Use this histogram to answer questions **28** *and* **29**.

28. Estimate the mode of the distribution.

A. 51.5
B. 52.5
C. 53.5
D. 54.5

29. What is the median class?

A. 60.5 – 70.5
B. 50.5 – 60.5
C. 40.5 – 50.5
D. 30.5 – 40.5

30. If $2\log_x (3\frac{3}{8}) = 6$, find the value of x.

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

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

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

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

31. If $P = \{y: 2y \geq 6\}$ and $Q = \{y : y - 3 \leq 4\}$, where y is an integer, find $P \cap Q$.

A. $\{3, 4\}$

B. $\{3, 7\}$

C. $\{3, 4, 5, 6, 7\}$

D. $\{4, 5, 6\}$

32. Find the values of k in the equation $6k^2 = 5k + 6$.

A. $\left\{\frac{-2}{3}, \frac{-3}{2}\right\}$

B. $\left\{\frac{-2}{3}, \frac{3}{2}\right\}$

C. $\left\{\frac{2}{3}, \frac{-3}{2}\right\}$

D. $\left\{\frac{2}{3}, \frac{3}{2}\right\}$

33. If y varies directly as the square root of $(x + 1)$ and $y = 6$ when $x = 3$, find x when $y = 9$.

A. 8

B. 7

C. 6

D. 5

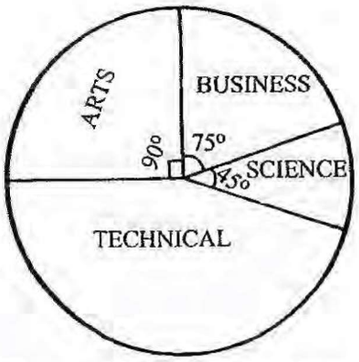
34. The graph of the relation $y = x^2 + 2x + k$ passes through the point (2, 0). Find the value of k.

A. 0

B. –2

C. –4

D. –8



The pie chart shows the distribution of 600 mathematics textbooks for Arts, Business, Science and Technical classes. *Use it to answer questions* **35** *and* **36.**

35. How many textbooks are for the Technical class?

A. 100
B. 150
C. 200
D. 250

36. What percentage of the total number of textbooks belongs to science?

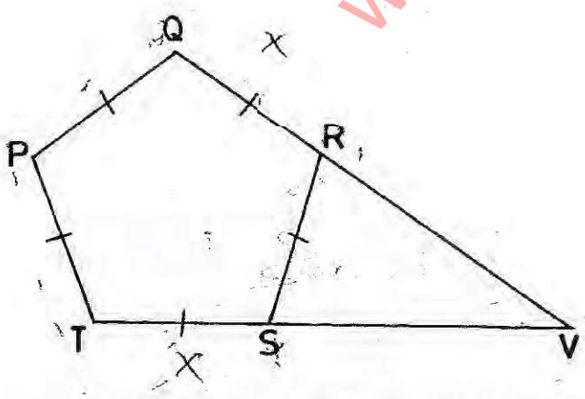
A. $12\frac{1}{2}\%$

B. $20\frac{5}{6}\%$

C. 25%

D. $41\frac{2}{3}\%$

37.



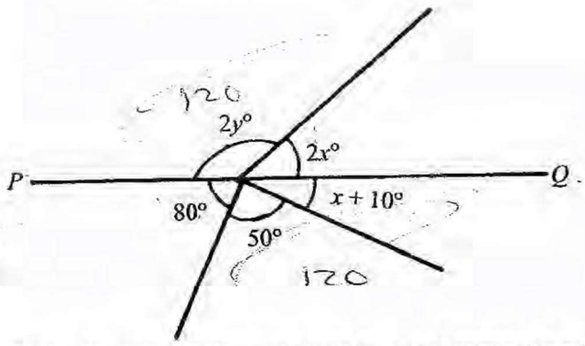
In the diagram, *PQRST* is a regular polygon with sides *QR* and *TS* produced to meet at *V*. Find the size of $\angle RVS$.

A. 36°
B. 54°
C. 60°
D. 72°

38. What is the locus of the point X which moves relative to two fixed points P and M on a plane such that $\angle PXM = 30°$?

A. The bisector of the straight line joining P and M
B. An arc of a circle with $\overline{PM}$ as a chord
C. The bisector of angle PXM
D. A circle centre X and radius PM

39.



In the diagram, PQ is a straight line. Calculate the value of the angle labelled $2y$.

A. 130°
B. 120°
C. 110°
D. 100°

40. When a number is subtracted from 2, the result equals 4 less than one-fifth of the number. Find the number.

A. 11
B. $\frac{15}{2}$
C. 5
D. $\frac{5}{2}$

41. Express $\frac{2}{x+3} - \frac{1}{x-2}$ as a simple fraction.

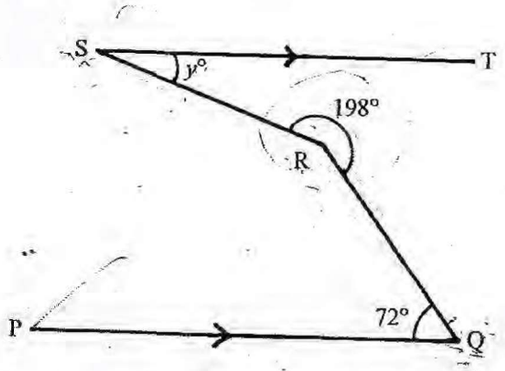
A. $\frac{x-7}{x^2+x-6}$
B. $\frac{x-1}{x^2+x-6}$
C. $\frac{x-2}{x^2+x-6}$
D. $\frac{x+7}{x^2+x-6}$

42. An interior angle of a regular polygon is 5 times **each** exterior angle. How many sides has the polygon?

A. 15
B. 12
C. 9
D. 6

90°
180°
360°

43.



In the diagram, $\overline{ST}//\overline{PQ}$, reflex angle $SRQ = 198°$ and $\angle RQP = 72°$. Find the value of y.

A. 18°
B. 54°
C. 92°
D. 108°

180
-72
108
360
-72

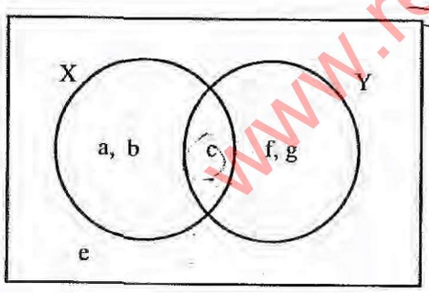
90
-72
18

S//y
90°
-72°
18°

∠A
∠z MLZ

∠y + 72° = 90°
∠y = 90° - 72°
∠y = 18°

44.



Using the Venn diagram, find $n(X \cap Y')$.

n U ∪ n

A. 2
B. 3
C. 4
D. 6

A B C
1 2 3

45. Given that $P = x^2 + 4x - 2$, $Q = 2x - 1$ and $Q - P = 2$, find x.

A. -2

B. -1

C. 1

D. 2

46. A pyramid has a rectangular base with dimensions 12 m by 8 m. If its height is 14 m, calculate the volume.

A. 344 m^3

B. 448 m^3

C. 632 m^3

D. 840 m^3

47. The slant height of a cone is 5 cm and the radius of its base is 3 cm.

Find, correct to the nearest whole number, the volume of the cone. [Take $\pi = \frac{22}{7}$].

A. 48 cm^3

B. 47 cm^3

C. 38 cm^3

D. 13 cm^3

48. The distance between two towns is 50 km. It is represented on a map by 5 cm. Find the scale used.

A. 1 : 1,000,000

B. 1 : 500,000

C. 1 : 100,000

D. 1 : 10,000

49. Given that $(x + 2)(x^2 - 3x + 2) + 2(x + 2)(x - 1) = (x + 2)\,M$, find M.

A. $(x + 2)^2$

B. $x(x + 2)$

C. $x^2 + 2$

D. $x^2 - x$

50. An open cone with base radius 28 cm and perpendicular height 96 cm was stretched to form a sector of a circle. Calculate the area of the sector. [Take $\pi = \frac{22}{7}$].

A. 8800 cm^2

B. 8448 cm^2

C. 4400 cm^2

D. 4224 cm^2