PC 4021
WASSCE (PC1) 2020
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
$1\frac{1}{2}$ hours

1

Name:.....

Index Number:.....

THE WEST AFRICAN EXAMINATIONS COUNCIL

West African Senior School Certificate Examination (WASSCE)
for Private Candidates, 2020 - First Series

(PC1) 2020 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 (PC1)', '2020', '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 **5251102068** and who is offering **General Mathematics/Mathematics (Core) 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS
Name: DIKKO (Surname) CHINEDU OLADAPO (Other Names) Examination: WASSCE (PC1) Year: 2020
Subject: GENERAL MATHEMATICS/MATHEMATICS (CORE) Paper: 1

INDEX NUMBER
5 ⊂0⊃ ⊂1⊃ ⊂2⊃ ⊂3⊃ ⊂4⊃ ■ ⊂6⊃ ⊂7⊃ ⊂8⊃ ⊂9⊃
2 ⊂0⊃ ⊂1⊃ ■ ⊂3⊃ ⊂4⊃ ⊂5⊃ ⊂6⊃ ⊂7⊃ ⊂8⊃ ⊂9⊃
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6 ⊂0⊃ ⊂1⊃ ⊂2⊃ ⊂3⊃ ⊂4⊃ ⊂5⊃ ■ ⊂7⊃ ⊂8⊃ ⊂9⊃
8 ⊂0⊃ ⊂1⊃ ⊂2⊃ ⊂3⊃ ⊂4⊃ ⊂5⊃ ⊂6⊃ ⊂7⊃ ■ ⊂9⊃

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

PAPER CODE
4 ⊂0⊃ ⊂1⊃ ⊂2⊃ ⊂3⊃ ■ ⊂5⊃ ⊂6⊃ ⊂7⊃ ⊂8⊃ ⊂9⊃
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2 ⊂0⊃ ⊂1⊃ ■ ⊂3⊃ ⊂4⊃ ⊂5⊃ ⊂6⊃ ⊂7⊃ ⊂8⊃ ⊂9⊃
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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.

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Do not write in this margin

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. Given that $P = \{2, 4, 5, 6\}$ and $Q = \{1, 3, 6, 7\}$ are subsets of $\mu = \{1, 2, 3, 4, 5, 6, 7\}$, find $P' \cap Q$.

A. $\{6\}$
B. $\{1, 3, 7\}$
C. $\{3, 4, 7\}$
D. $\{1, 3, 4, 7\}$

2. Express, (0.0005 x 8.385), correct to **three** significant figures.

A. 0.0004
B. 0.004
C. 0.0042
D. 0.00419

3. Given that $(4 \times y) = 0 \pmod 6$, $y > 0$, find the **least** value of y.

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

4. If $\left(5\sqrt{2} - \sqrt{3}\right)^2 = K - 10\sqrt{6}$, find the value of K.

A. 15
B. 30
C. 50
D. 53

5. If $Q41_{five} = 240_{six}$, find the value of Q.

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

6. Simplify: $\dfrac{\log_2 6 - \log_2 3}{\log_2 8 - 2\log_2 (\frac{1}{2})}$.

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

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

C. $\frac{1}{3}\log_2 3$

D. $\dfrac{1}{\log_2 3}$

Do not write in this margin

Index Number:.....

7. Find the values of x which satisfies $x + 3 > 1$ and $2x - 1 \leq 3$.

A. $-2 < x \leq 1$
B. $-2 < x \leq 2$
C. $2 < x \leq 4$
D. $2 \leq x < 4$

8. Solve: $\frac{6}{15} + \frac{1}{x} = \frac{2}{15} + \frac{1}{5x}$.

A. $x = -3$
B. $x = 3$
C. $x = 1.5$
D. $x = -1.5$

9. Given that P is inversely proportional to Q and $P = \frac{2}{3}$ when $Q = \frac{3}{4}$, find P when $Q = \frac{2}{5}$.

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

10. Make q the subject of the relation

$$t = \sqrt{\frac{pq}{r} - r^3 q}.$$

A. $q = \frac{p - r^4}{rt^2}$
B. $q = \frac{rt^2}{p - r^4}$
C. $q = \frac{rt^2 + r^4}{p}$
D. $q = \frac{t^2}{p - r^4}$

11. On a committee of 35 members, the ratio of men to women is 5 : 2. How many more women should be added to the committee so as to have the ratio of men to women as 5 : 4?

A. 10
B. 15
C. 20
D. 25

12. The **first** term of an Arithmetic Progression (*A.P.*) is 16. If the common difference is 15, find the 13th term.

A. 180
B. 186
C. 196
D. 201

13. Given that $3^{x+y} = 81$ and $2x - y = 5$, find the value of $(x + y)$.

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

14. Adongo's house is 6 *km* east of Binga's house. Chamba also stays 6 *km* south of Binga. What is the bearing of Chamba's house from Adongo's house?

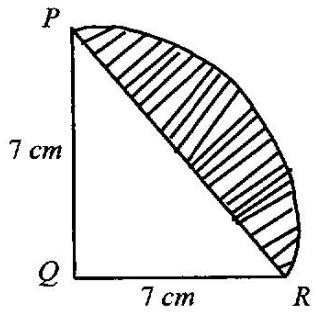
A. 045°
B. 090°
C. 135°
D. 225°

15. The line $5x - 2y = k$ passes through the point $(3, -1)$. Find the value of k.

A. -1
B. -7
C. 13
D. 17

Index Number:.....

16.



NOT DRAWN TO SCALE

The diagram shows a quadrant of a circle of radius 7 *cm*. Find the area of the shaded portion. [Take $\pi = \frac{22}{7}$]

A. 14.0 cm^2
B. 28.0 cm^2
C. 32.5 cm^2
D. 129.5 cm^2

17. The volume of a cylinder is 577.5 cm^3 and its height is 15 *cm*. Calculate the radius of the base. [Take $\pi = \frac{22}{7}$]

A. 3.5 *cm*
B. 5.7 *cm*
C. 7.5 *cm*
D. 7.7 *cm*

18. In a right angled triangle, one of the acute angles is twice the other. Find the **smallest** angle.

A. 25°
B. 30°
C. 45°
D. 60°

19. Given that $\sin (5x)° = \cos 60°$, find the value of x.

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

20. Consider these two statements:
P : N is an odd number.
Q : N is a prime number greater than 2.

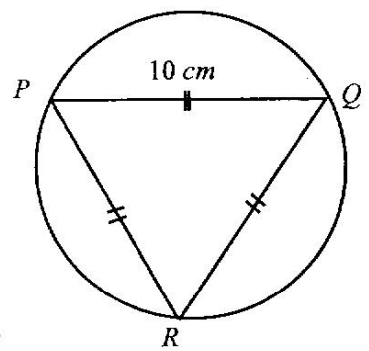
Express "If N is not an odd number then N is not a prime number greater than 2" in symbolic form.

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

21. Given that n is the first of three consecutive numbers and the sum of the three numbers exceeds the square of the first number by 5. Express this information in an equation.

A. $3n = n^2 + 5$
B. $3n = n^2 - 5$
C. $3n = n^2 + 2$
D. $3n = n^2 - 2$

22.



NOT DRAWN TO SCALE

The diagram shows an equilateral triangle PQR inscribed in a circle. If $|PQ| = 10$ *cm*, calculate the radius of the circle.

A. 5.8 *cm*
B. 8.7 *cm*
C. 10.0 *cm*
D. 11.5 *cm*

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Index Number:.....

23. Given that $\frac{1}{p} = \frac{2}{q} - \frac{3}{r}$, find the value of r when $p = 2$ and $q = 5$.

A. 30
B. −0.3
C. 0.3
D. −30

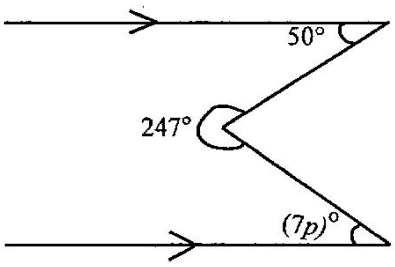
24. Calculate the standard deviation of 4, 1, 8, 5, 9, 6, 3 and 4.

A. 6.9
B. 3.2
C. 2.9
D. 2.4

25. A kite is attached at the tip of a string 20 m long. If the string is inclined at an angle of 24° to the horizontal, how far is the kite from the horizontal?

A. 8.23 m
B. 8.13 m
C. 7.96 m
D. 7.83 m

26.



NOT DRAWN TO SCALE

Find the value of P in the diagram.

A. 67
B. 32
C. 9
D. 8

27. Calculate the value of an angle which is 50° less than its supplement.

A. 70°
B. 65°
C. 50°
D. 20°

28. The probabilities that three students X, Y and Z will pass an examination are $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{2}{5}$ respectively. If they all sat for the examination, what is the probability that **only** Y and Z would pass?

A. $\frac{29}{30}$
B. $\frac{1}{10}$
C. $\frac{1}{15}$
D. $\frac{1}{30}$

29. The height of a solid cone is 2.4 m. If its base radius is 0.7 m, calculate, correct to **two** decimal places, the total surface area of the cone. [Take $\pi = 3.14$]

A. 6.03 m^2
B. 6.81 m^2
C. 7.03 m^2
D. 7.81 m^2

30. Factorize $2x^2 + 7x - 15$.

A. $(x + 3)(2x - 5)$
B. $(x - 3)(2x + 5)$
C. $(2x + 3)(x - 5)$
D. $(2x - 3)(x + 5)$

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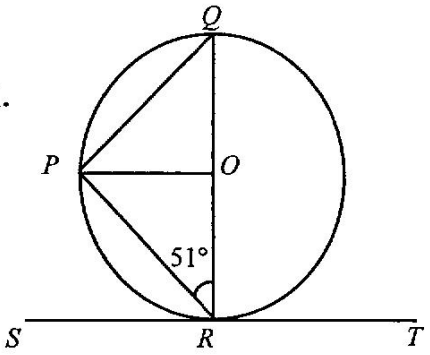
Index Number:.....

31.



NOT DRAWN TO SCALE

In the diagram, ST is a tangent to the circle with centre O and $\angle ORP = 51°$. Find $\angle OPQ$.

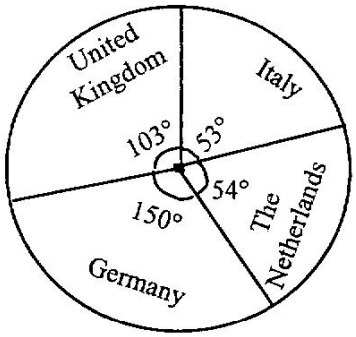
A. 51°
B. 49°
C. 39°
D. 31°

32. If $y = \frac{1}{x^2 - x}$, find the values of x for which y is undefined.

A. −1, 2
B. 0, 1
C. 1, 2
D. −1, 0

33. If the sum of five consecutive integers is 50, what is the value of the **smallest** integer?

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



NOT DRAWN TO SCALE

The pie chart shows the monthly exports from Liberia to some European countries. The total monthly export earnings amounted to £281.40 million. *Use this information to answer questions* **34** *and* **35**.

34. Find the value of goods exported to Germany.

A. £80.15 million
B. £43.20 million
C. £117.25 million
D. £160.60 million

35. How much did the value of exports to United Kingdom **exceed** the exports to Italy?

A. £39.08 million
B. £39.80 million
C. £39.88 million
D. £39.98 million

36. The interior angles of a polygon are $(3x + 10)°$, $(5x - 10)°$, $(5x + 10)°$, $(4x)°$, $(5x - 40)°$ and $(3x)°$. Find the value of x.

A. 25
B. 30
C. 35
D. 45

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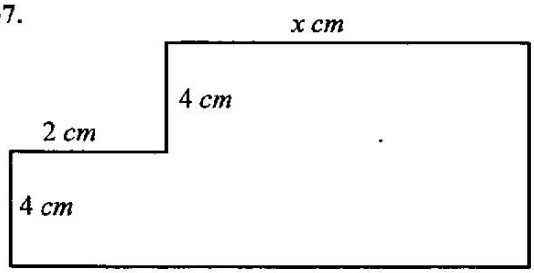
Index Number:.....

37.



NOT DRAWN TO SCALE

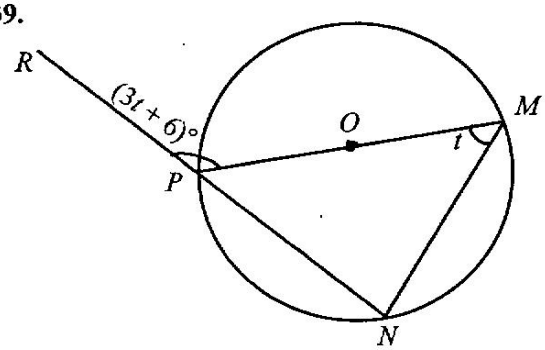
The diagram shows a rectangle from which a rectangle has been cut off. If the area of the remaining part is 56 cm^2, find the value of x.

A. 8
B. 6
C. 4
D. 3

38. If the mean of $(x+1)$, 2, 8, 7, 4, 6 and 4 is 5, find the median.

A. 8
B. 7
C. 4
D. 2

39.



NOT DRAWN TO SCALE

In the diagram, POM is a diameter, $\angle PMN = t°$ and $\angle RPM = (3t+6)°$. Find the value of t.

A. 84°
B. 42°
C. 36°
D. 21°

40. An agent receives x% commission on every sale on product X and y% commission on every sale on product Y. If the total sales in a particular month were ₦200,000.00 and ₦700,000.00 for products X and Y respectively, find the total commission of the agent?

A. ₦$(7{,}000x + 4{,}000y)$
B. ₦$(2{,}000x + 500y)$
C. ₦$(2{,}000x + 7{,}000y)$
D. ₦$(7{,}000x + 2{,}000y)$

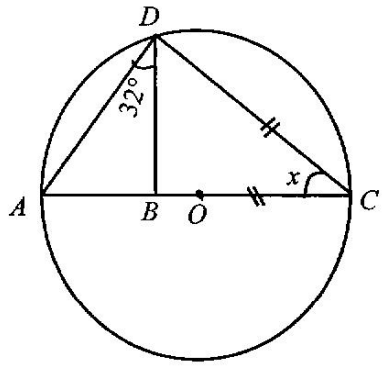
41. X and Y are points on the sides PQ and PR of ΔPQR respectively such that $\overline{XY}$ is parallel to $\overline{QR}$. If $|PX| = 4$ cm, $|QX| = 2$ cm and $|XY| = 6$ cm, find $|QR|$.

A. 4 cm
B. 6 cm
C. 9 cm
D. 12 cm

42. A straight line passes through the points (2, 12), (6, −4) and (14, y). Find the value of y.

A. −36
B. −28
C. 28
D. 36

43.



NOT DRAWN TO SCALE

In the diagram, O is the centre of the circle and $\angle ADB = 32°$. Find the value of x.

A. 24°
B. 38°
C. 58°
D. 64°

44. If $(x - 3)$ is a factor of $2x^2 - x + p$, find the value of p.

A. -15
B. -16
C. -30
D. -35

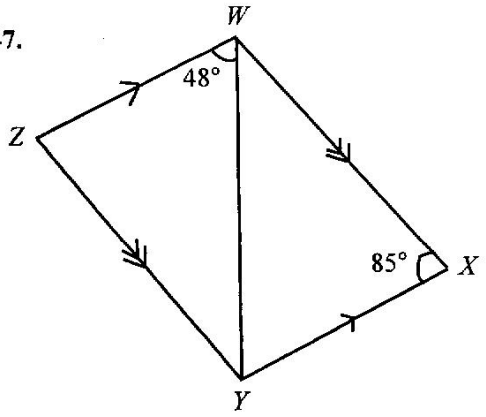
45. A cube has a surface area of $384\ cm^2$. If the sides of the cube is doubled, what will be the surface area of the new cube?

A. $356\ cm^2$
B. $834\ cm^2$
C. $1536\ cm^2$
D. $1824\ cm^2$

46. In an examination, Bala scored 72 % in Mathematics, 68 % in Chemistry and X % in Physics. If the mean mark in the three subjects was 65 %, find the value of X.

A. 65
B. 60
C. 55
D. 50

47.

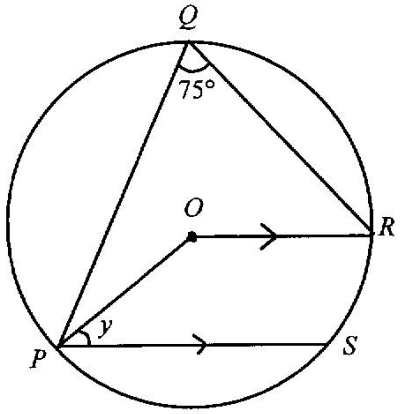


NOT DRAWN TO SCALE

In the diagram, $WXYZ$ is a parallelogram, $\angle ZWY = 48°$ and $\angle WXY = 85°$. Find $\angle XYZ$.

A. 85°
B. 95°
C. 105°
D. 133°

48.



NOT DRAWN TO SCALE

In the diagram, O is the centre of $PQRS$, $\angle PQR = 75°$. If $\angle OPS = y$ and OR//PS, find the value of y.

A. 15°
B. 30°
C. 45°
D. 75°

49. 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. 10 m
B. 14 m
C. 16 m
D. 18 m

50. Simplify: $\sqrt{6}\left(\frac{1}{\sqrt{2}} + 2\sqrt{2}\right)$.

A. $3\sqrt{3}$

B. $5\sqrt{3}$

C. $6\sqrt{3}$

D. $8\sqrt{3}$

EXAMINATION MALPRACTICE IS CORRUPTION. DO NOT PARTICIPATE IN IT.