

SC4021R
WASSCE 2024
GENERAL MATHEMATICS/
MATHEMATICS (CORE) 1
Objective Test
1½ hours

1

Name.....

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 answers you wish to change.

ria

Do all rough work on this question paper.

Now answer the following questions.

1. R, S and T are subsets of the universal set $U = \{1, 2, 3, 4, 5\}$ such that $R = \{1, 2, 3\}$, $S = \{2, 3, 4\}$ and $T = \{4, 5\}$. Find $(R \cup S) \cap T'$.

- A. $\{4\}$
- B. $\{1, 2, 3\}$
- C. $\{4, 5\}$
- D. $\{1, 2, 3, 4\}$

2. If $234_x = 76_9$, find the value of x .

- A. 5
- B. 6
- C. 7
- D. 8

ria

3. Express the difference between $\frac{5}{6}$ and $\frac{1}{3}$ as a percentage.

- A. 30 %
- B. 40 %
- C. 50 %
- D. 60 %

ria

4. Given that $\log_x 64 = 3$, find the value of x .
- A. 1
B. 3
C. 4
D. 5
5. Write 20,900 in standard form.
- A. 2.09×10^{-4}
B. 2.1×10^{-4}
C. 2.1×10^4
D. 2.09×10^4
6. Find the fifth term of the sequence 14, 18, 22, ...
- A. 20
B. 30
C. 34
D. 48
7. Find the percentage error in approximating 3.75 cm to be 4.0 cm.
- A. 6.67 %
B. 6.25 %
C. 0.25 %
D. 25 %
8. Solve: $3x^2 + 4x = 4$.
- A. $x = 2, \frac{2}{3}$
B. $x = 2, -\frac{2}{3}$
C. $x = -2, \frac{2}{3}$
D. $x = -2, -\frac{2}{3}$
9. Given that $5 - \frac{1}{2}x \leq 7$ where x is real, find x .
- A. $x \leq -4$
B. $x \geq -4$
C. $x \geq 4$
D. $x \leq -1$

10. A variable P varies directly as the cube root of Q . If $P = 4$ when $Q = 8$, find P when $Q = 64$.

A. 16
B. 8
C. 4
D. 2

11. Make r the subject of the relation $\frac{1}{p} = q - \frac{1}{r}$.

A. $r = \frac{p}{q-p}$

B. $r = \frac{p}{q(p-1)}$

C. $r = \frac{p}{qp-1}$

D. $r = \frac{q}{q(p-1)}$

12. For what value of R is $3x^2 - 7x + R$ a perfect square?

A. $8\frac{1}{6}$

B. $4\frac{1}{12}$

C. $2\frac{1}{24}$

D. $1\frac{13}{36}$

ria

13. A total of 222 books were shared among 7 students and 5 teachers. If each student received 6 books less than a teacher, find the number of books each student received.

A. 28
B. 18
C. 16
D. 12

14. A solid cone is 7 cm high and the base radius is 1.5 cm. Calculate the volume of the cone.
[Take $\pi = \frac{22}{7}$]

A. 49.5 cm^3
B. 33.0 cm^3
C. 16.5 cm^3
D. 11.0 cm^3

ria

15. Simplify: $\frac{6x-1}{4} - \frac{3-2x}{6} + 2$. ria
- A. $\frac{22x+15}{12}$
- B. $\frac{22x+17}{12}$
- C. $\frac{22x-15}{12}$ ria
- D. $\frac{22x-17}{12}$
16. By how much is the sum of $6x$, $(12x-10)$ and $(18x+2)$ less than $60x$?
- A. $-24x-8$
- B. $-24x+8$
- C. $24x-8$
- D. $24x+8$
17. Express $\frac{1}{a-b} - \frac{1}{a+b}$ as a single fraction.
- A. $\frac{1}{2a}$
- B. $-\frac{1}{2b}$
- C. $\frac{2a}{a^2-b^2}$
- D. $\frac{2b}{a^2-b^2}$ ria
18. A ladder, 9 m long leans against a vertical wall making an angle of 64° with the horizontal. Calculate, correct to one decimal place, the distance of the foot of the ladder from the wall.
- A. 8.1 m
- B. 18.5 m
- C. 3.9 m
- D. 5.8 m
19. The interior angles of a polygon are x° , $(2x)^\circ$, $(x+10)^\circ$, $(x-10)^\circ$ and $(x+60)^\circ$. ria
Find the value of x .
- A. 80
- B. 70
- C. 60
- D. 50

20. Find the length of the line joining the points $M(-3, 4)$ and $N(5, -2)$.
- A. 5 units
 - B. 6 units
 - C. 10 units
 - D. 12 units

21. The bearing of $N 62^\circ W$ is the same as

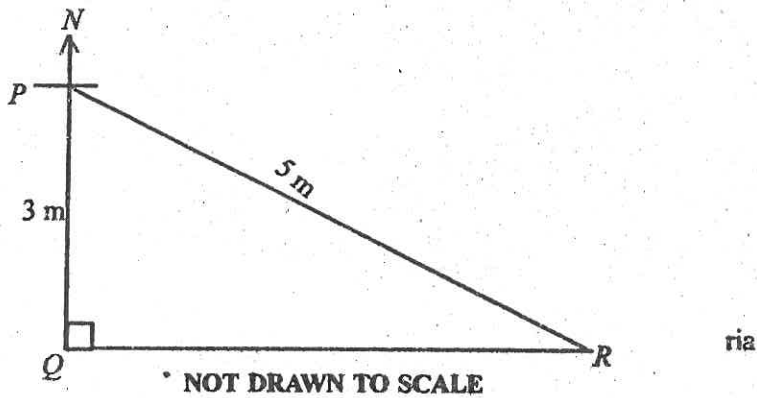
- A. 298° .
- B. 242° .
- C. 152° .
- D. 062° .

ria

22. Calculate the standard deviation of 6, 7, 8, 9 and 10.

- A. $\sqrt{2}$
- B. $\sqrt{3}$
- C. $2\sqrt{2}$
- D. $\sqrt{10}$

- 23.

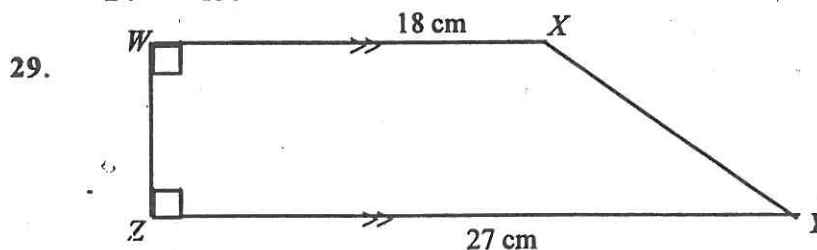


In the diagram, $|PQ| = 3 \text{ m}$, $|PR| = 5 \text{ m}$ and $\angle PQR = 90^\circ$.

Find, correct to the nearest degree, the bearing of P from R .

- A. 127°
- B. 143°
- C. 307°
- D. 323°

24. Given that \$3,750.00 amounts to \$4,250.00 in 6 years, find the rate of simple interest per annum.
ria
- A. $2\frac{1}{6}\%$
- B. $2\frac{2}{9}\%$
- C. $3\frac{1}{6}\%$
- D. $3\frac{2}{9}\%$
25. A side of a rectangle is 7 m shorter than the adjacent side. If the perimeter of the rectangle is 46 m, find the length of the longer side.
- A. 8 m
- B. 10 m
- C. 12 m
- D. 15 m
26. Given that $\cos 2x = \sin 28^\circ$, $0^\circ < x < 90^\circ$, find the value of x .
- A. 28°
- B. 31°
- C. 57°
- D. 62°
- ria
27. A cuboid has the same volume as a cylinder. If the base radius of the cylinder is 7 cm and the base area of the cuboid is $1,232 \text{ cm}^2$, express as a ratio the height of the cuboid to the height of the cylinder. [Take $\pi = \frac{22}{7}$]
- A. 8 : 1
- B. 3 : 1
- C. 1 : 3
- D. 1 : 8
28. A regular polygon has 15 sides. Calculate the size of each interior angle.
- A. 126°
- B. 136°
- C. 146°
- D. 156°



NOT DRAWN TO SCALE

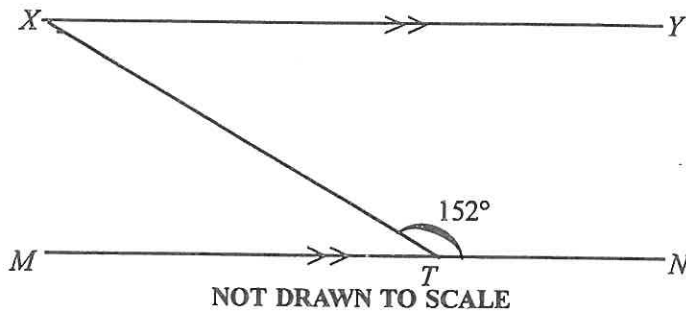
In the diagram $WXYZ$ is a trapezium, $\angle XWZ = \angle WZY = 90^\circ$, $|WX| = 18 \text{ cm}$, and $|ZY| = 27 \text{ cm}$,
If the area is 270 cm^2 , find the perimeter.

- A. 72 cm
- B. 70 cm
- C. 67 cm
- D. 57 cm

30. The diameter of a sphere is 42 cm . Find the volume. [Take $\pi = \frac{22}{7}$]
- 19,404 cm³
 - 25,488 cm³
 - 35,544 cm³
 - 38,808 cm³

31. Given that $32 \pmod{6} = P$, find the value of P . ria
- 2
 - 3
 - 4
 - 5

32.



In the diagram, $\overline{XY} \parallel \overline{MN}$ and $\angle XTN = 152^\circ$. Find $\angle TXY$

- 152°
 - 54°
 - 36°
 - 28°
33. A television set was sold for Le 4,800.00 at a loss of 20 %. Find the cost price.
- Le 6,000.00
 - Le 7,500.00
 - Le 5,400.00
 - Le 5,000.00
34. An arc subtends an angle of 40° at the centre of a circle of radius 21 cm. What is the area of the sector containing the angle? [Take $\pi = \frac{22}{7}$]
- 154 cm²
 - 144 cm²
 - 124 cm²
 - 77 cm²

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Age (years)	3	4	5	6	7
Number of Children	9	16	27	15	3

The table shows the distribution of the ages of children at a clinic on a certain day.
Use the information to answer questions 35 and 36.

35. Calculate, correct to the nearest whole number the mean age of the children.

- A. 4
- B. 5
- C. 6
- D. 7

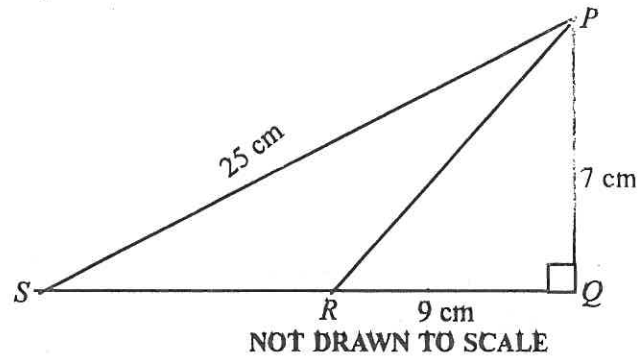
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36. Find the median age.

- A. 4
- B. 5
- C. 6
- D. 7

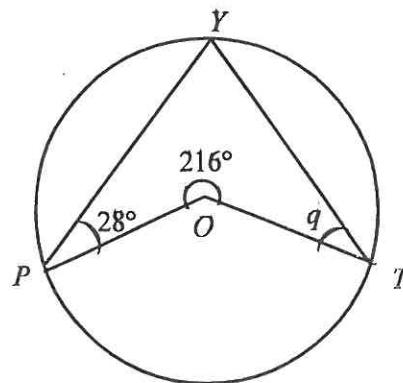
37.

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In the diagram, $|PQ| = 7$ cm, $|RQ| = 9$ cm and $|PS| = 25$ cm. Find $|SR|$.

- A. 12 cm
- B. 15 cm
- C. 10 cm
- D. 13 cm



38. In the diagram, PYT is a circle centre O , reflex $\angle POT = 216^\circ$ and $\angle OPY = 28^\circ$. Find the value of q .

- A. 44°
- B. 28°
- C. 56°
- D. 108°

ria

Turn over

39. Which of the following is **not** a property of a rhombus?

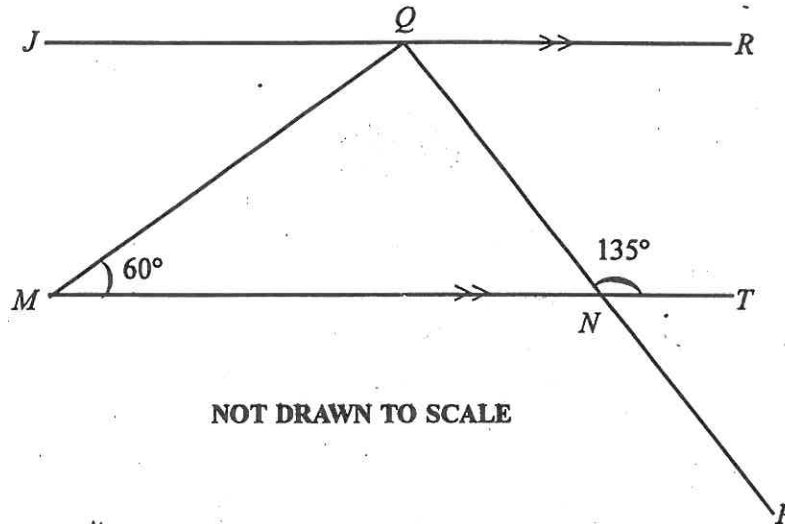
ria

- A. All four sides are equal.
- B. All angles are acute.
- C. It has two lines of symmetry.
- D. Diagonals bisect at right angles.

40. The sum of four consecutive odd numbers is 336. Find the **smallest** of the numbers.

- A. 79
- B. 81
- C. 89
- D. 91

ria



In the diagram, $\overline{JR} \parallel \overline{MT}$, $\angle QMT = 60^\circ$ and $\angle QNT = 135^\circ$.

Use the information to answer questions 41 and 42.

41. Find $\angle RQP$.

- A. 60°
- B. 45°
- C. 135°
- D. 50°

42. Find $\angle MQP$.

- A. 75°
- B. 60°
- C. 135°
- D. 55°

43. The probability that two pupils pass an examination are 25% and 60%. Find the probability that the two pupils **fail** the examination.

- A. $\frac{1}{10}$
- B. $\frac{3}{10}$
- C. $\frac{3}{20}$
- D. $\frac{1}{20}$

ria

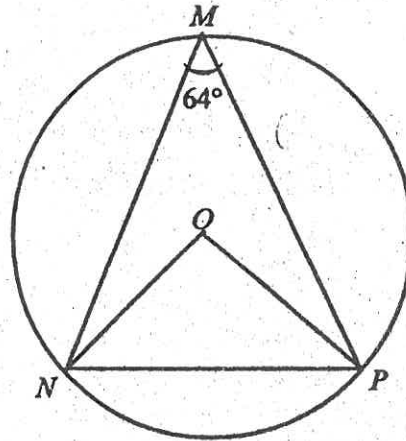
44. Factorize completely: $5k^2 - 15pk + 6k - 18p$.

- A. $(k + 3p)(5k + 6)$
- B. $(k - 3p)(5k + 6)$
- C. $(k - 3p)(5k - 6)$
- D. $(k + 3p)(5k - 6)$

45. A bag contains 6 red, 4 yellow and 2 blue balls all of the same size and weight. If a ball is picked at random from the bag, find the probability that the ball is red or blue.

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

46.



NOT DRAWN TO SCALE

In the diagram M , N and P are points on a circle centre O . If $\angle NMP = 64^\circ$, find $\angle ONP$.

- A. 64°
- B. 26°
- C. 32°
- D. 52°

ria

47. The heights, in cm, of 5 mango seedlings are 1, 3, 4, 5, and 7. Calculate the mean deviation.

- A. 1.2
- B. 1.4
- C. 1.6
- D. 1.8

ria

48. The sum of four consecutive even numbers is 252. Find the difference between the largest and the smallest number. ria

A. 2
B. 4
C. 6
D. 8

49. A line passes through the point $(2, -4)$. If the gradient of the line is $\frac{1}{2}$, find the equation of the line.

A. $x + 2y = 10$
B. $x - 2y = 10$
C. $2x + y = 10$
D. $2x - y = 10$

- ria
50. For what value of x is $\frac{x^2 + 15x + 50}{x - 5}$ not defined?

A. -10
B. -5
C. 10
D. 5

ria

END OF PAPER