WEST AFRICAN SENIOR SCHOOL CERTIFICATE EXAMINATION

CORE MATHEMATICS

PAPER 1 — OBJECTIVE TEST

Answer all the questions

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1. Correct 0.00798516 to three significant figures.

A. 0.0109
B. 0.0800
C. 0.00799
D. 0.008

2. Simplify: $(11_{two})^2$.

A. 1001_{two}
B. 1101_{two}
C. 101_{two}
D. 10001_{two}

3. Solve: $2^{\sqrt{(2x+1)}} = 32$.

A. 13
B. 24
C. 12
D. 11

4. If $\log_{10}2 = m$ and $\log_{10}3 = n$, express $\log_{10}72$ in terms of m and n.

A. $3m + n$
B. $m + 3n$
C. $4mn$
D. $3mn$

5. Find the 5^{th} term of the sequence 17, …

A. 22
B. 24
C. 36
D. 26

6. If $P = \{-3 < x < 1\}$ and $Q = \{-1 \leq x \leq 1\}$ where x is a real number, find $P \cap Q$.

A. $\{-1 < x < 1\}$
B. $\{-3 \leq x \leq 1\}$
C. $\{-3 < x < 1\}$
D. $\{-1 \leq x \leq 1\}$

7. Factorise $6pq - 3ps - 3qr + 6pr$.

A. $3(r - p)(2q + s)$
B. $3(p + r)(2q - s)$
C. $3(p - r)(2q - s)$
D. $3(r - p)(s - 2q)$

8. What number should be subtracted from the sum of $2\frac{1}{6}$ and $2\frac{7}{12}$ to give $3\frac{1}{4}$?

A. $\frac{1}{3}$
B. $1\frac{1}{2}$
C. $1\frac{1}{6}$
D. $\frac{1}{2}$

9. Mensah is 5 years old and Joyce is thrice as old as Mensah. In how many years will Joyce be twice as old as Mensah?

A. 3 years
B. 10 years
C. 5 years
D. 15 years

10. If $16 \times 2^{(x+1)} = 4^x \times 8^{(1-x)}$, find the value of x.

A. -4
B. 4
C. 1
D. -1

11. The circumference of a circular track is 9 km. A cyclist rides round it a number of times and stops after covering a distance of 302 km. How far is the cyclist from the starting point?

A. 5 km
B. 6 km
C. 7 km
D. 3 km

12. Simplify: $2\sqrt{7} - {}^{14}/_{\sqrt{7}} + {}^{7}/_{\sqrt{21}}$.

A. ${}^{\sqrt{21}}/_{21}$
B. ${}^{7\sqrt{21}}/_{21}$
C. ${}^{\sqrt{21}}/_{3}$
D. $3\sqrt{21}$

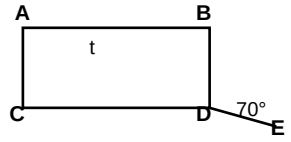
13. If $4x + 2y = 16$ and $6x - 2y = 4$, find the value of $(x - y)$.

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

14. Given that R is directly proportional to L and inversely proportional to P. $R = 3$ when $L = 9$ and $P = 0.8$. Find R when $L = 15$ and $P = 1.2$.

A. 2.2
B. 3.3
C. 6.6
D. 0.3

15.



NOT DRAWN TO SCALE

In the diagram, ∠ABC and ∠BCD are right angles, ∠BAD = t and ∠EDF = 70°. Find the value of t.

A. 70°
B. 165°
C. 140°
D. 110°

23. If $\tan\theta = {}^{3}/_{4}$, $180° < \theta < 270°$, find the value of $\cos\theta$.

A. ${}^{4}/_{5}$
B. ${}^{3}/_{5}$
C. $-{}^{4}/_{5}$
D. $-{}^{3}/_{5}$

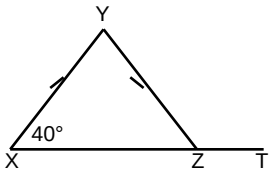
24. If ${}^{2}/_{(x-3)} - {}^{3}/_{(x-2)} = {}^{p}/_{(x-3)(x-2)}$, find p.

A. $(5 - x)$
B. $-(x + 5)$
C. $(13 - x)$
D. $-(5x - 13)$

25. The diagonals of a rhombus are 12 cm and 5 cm. Calculate its perimeter.

A. 26 cm
B. 24 cm
C. 17 cm
D. 34 cm

26.



NOT DRAWN TO SCALE

In the diagram, ■XYZ is produced to T. If |XY| = |ZY| and ∠XYT = 40°, find ∠XZT.

A. 110°
B. 130°
C. 120°
D. 140°

27. A solid brass cube is melted and recast as a solid cone of height *h* and base radius *r*. If the height of the cube is *h*, find *r* in terms of *h*.

A. $r = h$
B. $r = \sqrt{(h/\pi)}$
C. $r = \pi h$
D. $r = h\sqrt{(1/\pi)}$

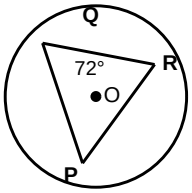
28. Which of the following is **not** an exterior angle of a regular polygon?

A. 60°
B. 72°
C. 24°
D. 15°

29. From a point *T*, a man moves 12 km due West and then moves 12 km due South to another point *Q*. Calculate the bearing of *T* from *Q*.

A. 225°
B. 315°
C. 045°
D. 135°

30.



NOT DRAWN TO SCALE

In the diagram, *O* is the centre of circle *PQRS*. ∠POR = 72° and OR // PS. Find ∠OPS.

A. 18°
B. 108°
C. 54°
D. 36°

31. A trapezium of sides 10 cm and 21 cm and height 8 cm is inscribed in a circle of radius 7 cm. Calculate the area of the region not covered by the trapezium. [Take $\pi = {}^{22}/_{7}$]

A. 84 cm²
B. 80 cm²
C. 30 cm²
D. 94 cm²

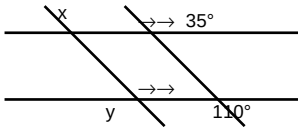
32. Find, correct to two decimal places, the mean of $1{}^{1}/_{2}$, $2{}^{2}/_{3}$, $3{}^{1}/_{4}$, $4{}^{1}/_{5}$ and $5{}^{5}/_{6}$.

A. 3.71
B. 3.70
C. 3.69
D. 3.72

33. A cyclist moved at a speed of *X* km/h for 2 hours. He then increased his speed by 2 km/h for the next 3 hours. If the total distance covered is 36 km, calculate his initial speed, *X*.

A. 12 km/h
B. 3 km/h
C. 4 km/h
D. 6 km/h

34.

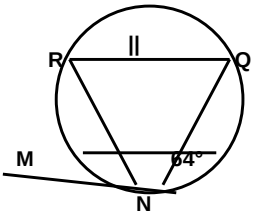


NOT DRAWN TO SCALE

Find the value of (x + y) in the diagram.

A. 215°
B. 70°
C. 135°
D. 145°

35.



NOT DRAWN TO SCALE

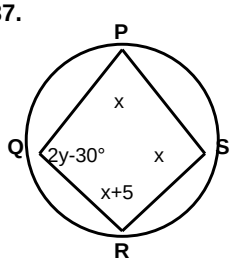
In the diagram, MP is a tangent to the circle NQR, ∠PNQ = 64° and |RQ| = |RN|. Find the angle marked *t*.

A. 130°
B. 115°
C. 58°
D. 64°

36. Find the first quartile of 7, 8, 7, 9, 11, 8, 7, 9, 6 and 8.

A. 8.5
B. 7.0
C. 7.5
D. 8.0

37.



NOT DRAWN TO SCALE

In the diagram, PQRS is a circle. Find the value of *x*.

A. 50°
B. 30°
C. 80°
D. 100°

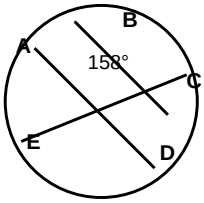
38. A cone has a base radius of 8 cm and height 11 cm. Calculate, correct to two decimal places, the curved surface area. [Take $\pi = {}^{22}/_{7}$]

A. 341.98 cm²
B. 276.57 cm²
C. 201.14 cm²
D. 477.71 cm²

39. Given that $\sin x = {}^{3}/_{5}$, $0° \leq x \leq 90°$, evaluate $(\tan x + 2 \cos x)$.

A. $2{}^{11}/_{20}$
B. $2{}^{7}/_{20}$
C. ${}^{11}/_{20}$
D. ${}^{1}/_{20}$

40.



NOT DRAWN TO SCALE

In the diagram, EC is a diameter of the circle ABCDE. If ∠ABC = 158°, find ∠ADE.

A. 112°
B. 90°
C. 68°
D. 22°

41. The table shows the heights of thirty-seven players of a basketball team.

Height (cm)	160	161	162	163	164
No. of players	4	6	3	7	17

Calculate, correct to one decimal place, the mean height of the players.

A. 163.0
B. 162.0
C. 160.0
D. 165.0

42. XY is a line segment with the coordinates X(–8, –12) and Y(p, q). If the midpoint of XY is (–4, –2), find the coordinates of Y.

A. (–6, –10)
B. (0, 8)
C. (4, 10)
D. (0, 4)

43. Five hundred tickets were sold for a concert. Tickets for adults and children were sold at $4.50 and $3.00 respectively. If the total receipts for the concert was $1,987.50, how many tickets for adults were sold?

A. 325
B. 235
C. 175
D. 400

44. The distance (d) between two villages is more than 18 km but not more than 23 km. Which of these inequalities represents the statement?

A. $18 \leq d \leq 23$
B. $18 < d < 23$
C. $18 \leq d < 23$
D. $18 < d \leq 23$

45.



NOT DRAWN TO SCALE

The pie chart represents the distribution of fruits on display in a shop. If there are 60 apples on display, how many oranges are there?

A. 80
B. 270
C. 120
D. 90

46. A box contains 40 identical balls of which 10 are red and 12 are blue. If a ball is selected at random from the box, what is the probability that it is neither red nor blue?

A. $^{9}/_{20}$
B. $^{3}/_{10}$

C. $\frac{1}{4}$
D. $\frac{11}{20}$

47. A fair die is tossed twice. What is the probability of getting a sum of at least 10?

A. $\frac{5}{36}$
B. $\frac{2}{3}$
C. $\frac{5}{18}$
D. $\frac{1}{6}$

48. A man will be (x + 10) years old in 8 years time. If 2 years ago, he was 63 years, find the value of x.

A. 55
B. 63
C. 57
D. 67

49. The equation of a line is given as 3x – 5y = 7. Find its gradient (slope).

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

50. For what value of x is $\frac{(4 - 2x)}{(x + 1)}$ undefined?

A. 2
B. –1
C. 1
D. –2

END OF PAPER