GREENLAWNS HIGH SCHOOL

Std 9   **MATHEMATICS**   **80M**

Time 2.5 hours   **Final Examination - 2023**

Attempt all questions from Section A and <u>any 4 questions from Section B</u>. Omission of essential steps will lead to loss of marks. Rough work must be done on the same page as the rest of the answer.

<u>SECTION A</u>

<u>(Attempt all questions from this section)</u>

<u>Question 1</u>

i) A ladder 20m long reaches the window of a building 16m above the ground. Find the distance between the foot of the ladder and the building. **(3)**

ii) If the radius of a circle is 13cm, find the length of a chord whose distance from the centre is 12cm. **(3)**

iii) Solve $\dfrac{\cos 33°}{\sin 54°} + \dfrac{\sec 79°}{\csc 11°} + \cos^2 45°$ **(4)**

<u>Question 2</u>

i) In the figure drawn below PQRS is a square, A and B are midpoints of PQ and QR respectively, prove that $\triangle PAS \cong \triangle QBP$ **(3)**
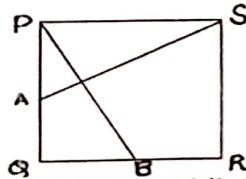

ii) Find a point on Y-axis which is equidistant from (6,5) and (-4,3) **(3)**

iii) The marks obtained by a group of students in a test out of 50 are given below **(4)**

40	9	12	46	37	17	27	30	42	28
19	39	20	5	33	19	40	12	41	17
50	35	6	10	21	7	49	4	32	7

Prepare a frequency distribution table for the above data taking class intervals 0-10, 10-20......

Question 3

i) The capacity of a cuboid is 360m³ find the length of the cuboid if its breadth and depth are 4m and 10m respectively. Hence find its total surface area. **(3)**

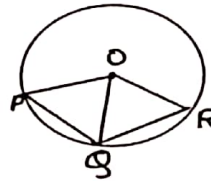ii) In the figure drawn below find   a) sinA   b) tanC   **(3)**

A

7 cm

B   24 cm   C
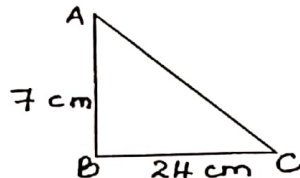
iii) Draw a histogram for the distribution given below   **(4)**

CI	161-170	171-180	181-190	191-200	201-210
f	9	12	18	16	6

Question 4

i) In the figure drawn below O is the centre of the circle PQ is a side of a   **(3)**
Regular hexagon and QR is a side of an equilateral triangle   **(3)**
Find a) $\angle POQ$
     b) $\angle QOR$
     c) $\angle OQR$

O

P

R

Q

ii) Simplify $\dfrac{4\sin^2 30 + \cos^2 30 - 3\tan^2 30}{2\sin 30 \cdot \tan 60 + \tan 45}$ **(3)**

iii) If the mean of x, x+14, x+7, x+2, x+8 , x+5 is 20 then find the value of x and hence find the median   **(4)**

SECTION B

(Attempt any 4 out of 5 questions from this section)

Question 5

i) The longest side of a right angled triangle is 29cm and one of the remaining sides is 21cm, calculate the area of this triangle   **(3)**

ii) Calculate the value of angle B if   **(3)**
(2cosB -1)(2sin²B-1)=0

iii) Expand $(\frac{2a}{3} - \frac{b^2}{4})^3$ **(4)**

Question 6

i)   If the median of 12,13,16, x+2, x+4, 28,30,32 when arranged in ascending   (3)
Order is 23 find x

ii)   Find the perimeter of a triangle whose vertices are A(8,6) , B(8,-2) and   (3)
C(2,-2)

iii) If $a^2 + \frac{1}{a^2} = 98$ find

1) $a + \frac{1}{a}$ 2) $a^3 + \frac{1}{a^3}$

Question 7

i)   Calculate the distance between chords XY = 6cm and ST = 8cm in a circle whose
centre is O and radius is 5cm ,given that the chords lie on the opposite sides of
the centre.   (4)

ii)   Prepare a cumulative distribution table for the data given below and   (4)
Answer the questions that follow

Class Interval	frequency
61-70	7
71-80	12
81-90	28
91-100	9
101-110	6

a) Write the class boundaries of the 3rd class interval
b) Write the class mark of the 5th class interval

iii) In the figure drawn below XU II YV, UX=YV prove that $\Delta UXO \cong \Delta VYO$ (2)
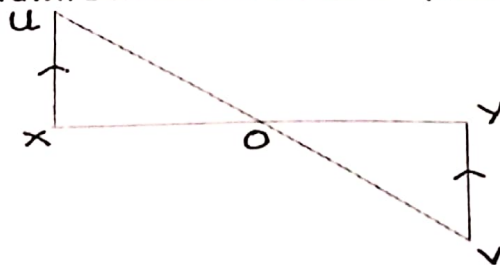
Question 8

i)   If sinA = $\frac{35}{37}$ find a) tan A   b) cosec C   (3)
ii)   If the total surface area of a cube is 1014m² find its volume   (3)
iii) In the figure drawn below calculate the length of AB   (4)
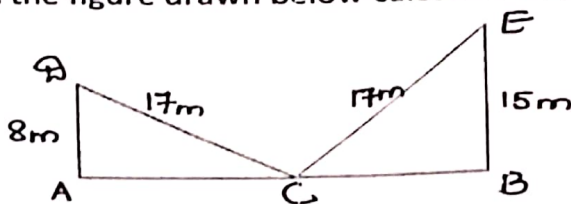
Question 9

i)   A racing track is bounded by two concentric circles whose radii are 35m and   (3)
     105m. Find the area of the track.

ii) If the mean of 20 observations is 63 find the resulting mean if each   (3)
     observation is
     a) Decreased by 7
     b) Increased by 30%
     c) Multiplied by 4

iii) Draw a frequency polygon for the following distribution without using a   (4)
     Histogram

CI	70-80	80-90	90-100	100-110	110-120
f	20	35	55	40	10