GREENLAWNS HIGH SCHOOL

STD 9 **TERMINAL EXAMINATION** **80M**

Time 2.5 hours **Mathematics** **2024**

Attempt all questions from Section A and any four questions from Section B. All working including rough work must be clearly shown and done on the same page as the rest of the answer. Omission of essential steps will result in loss of marks.

SECTION A

(Attempt all questions from this section)

QUESTION 1

Choose the correct answers to the questions from the given options (15)

i) If $x + \frac{1}{x} = 7$ then $x^2 + \frac{1}{x^2}$ is
   a) 7
   b) -7
   c) 47
   d) Both a and b

ii) The rationalizing factor of $\sqrt{2} + \sqrt{5}$ is
   a) $\sqrt{2}$
   b) $\sqrt{5}$
   c) $\sqrt{2} + \sqrt{5}$
   d) $\sqrt{2} - \sqrt{5}$

iii) When $100 - 16x^4$ is factorized we get
   a) $(10 + 4p^4)(10 - 4p^4)$
   b) $(10 + 4p^2)(10 - 4p^2)$
   c) $(10 + 4p^2)(10 + 4p^2)$
   d) $(10 - 4p^2)(10 - 4p^2)$

iv) The distance between origin and A(-6, 4) is
   a) $\sqrt{52}$
   b) $-\sqrt{52}$
   c) $\sqrt{52}$
   d) 52

v) If $4^{x+2} = 64 \times 4^3$ then the value of x is
   a) 6
   b) 5
   c) 4
   d) 1

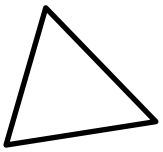
vi) $(-20)^3 + (19)^3 + (1)^3 =$
   a) -380
   b) 380

c) 3800
d) None of the above

vii) In the figure drawn below ABCD is a trapezium where AB II CD. X is midpoint of AD and Y is midpoint of BC then which of the following statements are true

a) XY = $\frac{1}{2}$ (AB + CD)
b) XY = 2(AB + CD)
c) XY = $\frac{1}{2}$ (AB - CD)
d) XY = 2(AB - CD)

viii) From the figure drawn the value of x & y is

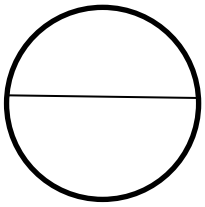


a) 50° , 80°
b) 80° , 50°
c) 50° , 50°
d) 80° , 80°

ix) $(-1)^{M}$ = 1 when
a) M is odd
b) M is even
c) M is composite
d) M is prime

x) In $\Delta\, SIT \text{ and } \Delta\, XYZ$, $SI = XY$, $IT = YZ$.
$If\ \Delta\, SIT \cong \Delta\, XYZ \ \text{ then which angles must be equal}$
a) $\angle S = \angle X$
b) $\angle T = \angle Z$
c) $\angle I = \angle Y$
d) None of these

xi) In the figure drawn below O is the centre of the circle whose radius is 2.5cm . If $\angle ABC = 90°$, then AB is



a) 4.5 cm
b) 3cm
c) 2cm
d) 4cm

xii) The point Z(-2,-5) lies in which quadrant
a) 1st Quadrant
b) 2nd Quadrant
c) 3rd Quadrant
d) 4th Quadrant

xiii) In $\Delta PQR, PM\ is$ the perpendicular bisector of QR then $\Delta\, PMQ \cong \Delta\, PMR\ by$
a) SSS Test
b) ASA Test
c) RHS Test
d) SAS Test

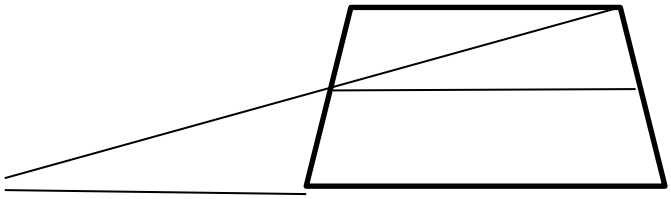
xiv) $[\,5^{-1} + 2^{-1}]^{-1}$ is

a) 7/10
b) 10/7
c) -7/10
d) -10/7

xv) When $x^2 - 27x + 26$ is factorized we get
a) (x-26) (x-1)
b) (x+26) (x-1)
c) (x-26) (x+1)
d) (x+26) (x+1)

QUESTION 2

a) In the figure drawn below PQRS is a trapezium, PS II QR. If X & Y are midpoints of PQ and SR (4)
Respectively prove that i) XT =XS ii) XY II PS.



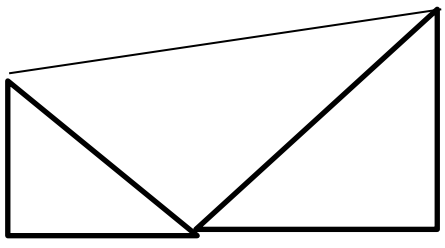
b) In the figure drawn below ABCD is a quadrilateral in which AD = BC & $\angle DAB = \angle CBA$ prove that (4)
i) $\Delta ABD \cong \Delta BAC$
ii) If BD =5x +9 and AC= 2x+21 find x
iii) If $\angle ABD = 67°$ & $\angle BAC = 5y + 2$ find y

c) Solve the following simultaneous equations <u>graphically</u> (4)
2x – y = 5
x + y +2=0

QUESTION 3

a) Expand the following (4)
i) $(6x - 5y)^3$
ii) $(2a - b - 4c)^2$

b) In the figure drawn below $\angle ABE = \angle CDE = \angle AEC = 90°$ find (4)
i) AB ii) CE iii) AC



c) Plot $\sqrt{3}$ on a number line (use a compass and ruler only) (5)

SECTION B

(Solve any 4 questions out of 5)

QUESTION 4

a) Factorise $x^{10}y^4 - x^4y^{10}$ (3)

b) Which point on the Y axis is equidistant from A(12,3) and (-5,10) (3)

c) Solve the following simultaneous equations using the Cross Multiplication Method (4)

$7x + 8y = 2$

$2x + 13y = 22$

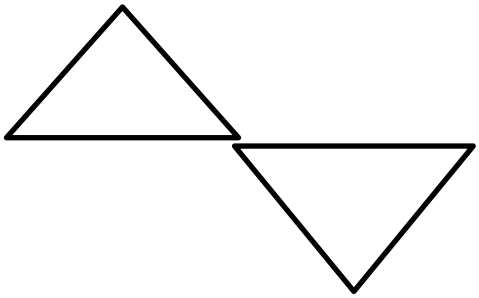
QUESTION 5

a) In ΔPQR, X & Y are midpoints of PQ and PR respectively if XY = 3x - 8 and QR = 2x + 8 . (3)
Find ' x' and hence find the length of QR.

b) Solve for x (3)

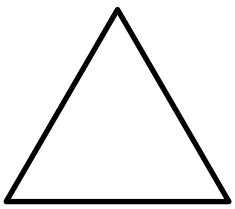
$\frac{3}{4}^{x-14} = \left(\frac{64}{27}\right)$

c) In the figure drawn below $\angle YXZ = \angle ZUV$ find x & y (4)



QUESTION 6

a) In the figure drawn below AB = AC and $\angle BAC = 34°$ find $\angle ACD$ (3)



b) One fifth of the sum of two numbers is 18 and the difference of the two numbers is 22. Find The numbers. (3)

c) Rationalize the denominator $\frac{1}{\sqrt{2}+\sqrt{3}-\sqrt{5}}$ (4)

QUESTION 7

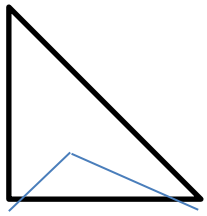
a) Simplify $\frac{1}{9}$ - 3 x 8 x 5 + $\frac{16}{25}$ (3)

b) Factorise $4x^4 + 3x^2y^2 + y^4$ (3)

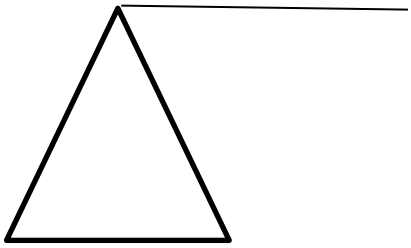
c) Find the co-ordinates of the circumcentre of ΔPQR where P(6,-6) , Q(3,-7) and R(3,3) (4)

QUESTION 8

a) In the figure drawn below , AO=3cm BO=4cm, AC=12cm & BC=13cm if $\angle AOB = 90°$, prove that $\angle CAB = 90°$ (3)



b) In the figure drawn below PS II QR find the value of x, y and z (3)



c) If $x^2 + \frac{1}{x^2} = 98$ find (4)

i) $x + \frac{1}{x}$

ii) $x^3 + \frac{1}{x^3}$