GREENLAWNS HIGH SCHOOL

First Terminal Examination

MATHEMATICS

Date: 04|10|2023 **Time: $2\frac{1}{2}h$**

Grade: IX **Marks: 80**

(Two hours and a half)

Answers to this Paper must be written on the paper provided separately.

You will not be allowed to write during the first 15 minutes.

This time is to be spent in reading the question paper.

The time given at the head of this Paper is the time allowed for writing the answers.

Attempt all questions from Section A and any four questions from Section B.

All working, including rough work, must be clearly shown and must be done on the same sheet as the rest of the answer.

Omission of essential working will result in loss of marks.

The intended marks for questions or parts of questions are given in brackets [ ].

Mathematical tables are provided.

Section A

(Attempt all question from this section)

Question1 [15]

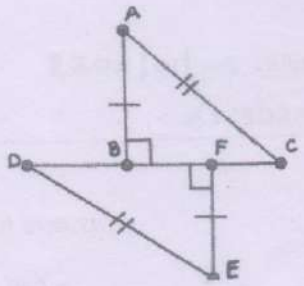
Choose the correct answers to the question from the option given below.

i. If $x = \sqrt{2} + 1$ then rationalizing 'x' will give.
   a) 0
   b) 1
   c) 3
   d) 2

ii. $(27)^{\frac{5}{3}} =$ _____
   a) 343
   b) 243
   c) 323
   d) 123

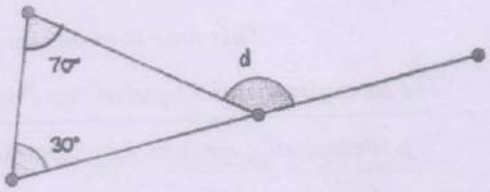
iii. The Factors of $a^2 - 81$ are
   a) $(a-3)(a+3)$
   b) $(a-3)(a+9)$
   c) $(a-3)(a+3)(a+9)$
   d) $(a-3)(a+3)(a-9)$

iv. In the figure given alongside, $\Delta ABC \cong \Delta EFD$ by _____



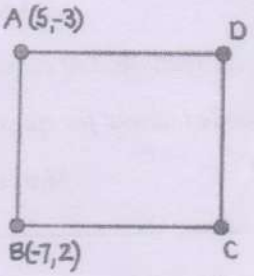
a) SSA test
b) SAA test
c) ASA test
d) RHS test

v. The measure of d from the figure given alongside is



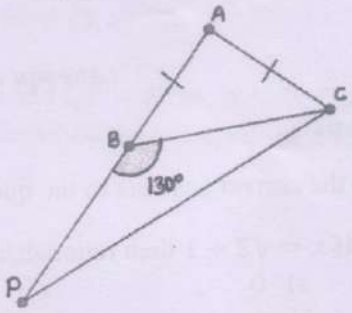
a) 180°
b) 100°
c) 70°
d) 30°

vi. The perimeter of square ABCD with coordinate $A(5,-3)$ *and* $B(-7,2)$ is



a) 13 units
b) 16 units
c) 65 units
d) 52 units

vii. In the figure given alongside $AB = AC$, then $\angle BAC$ is

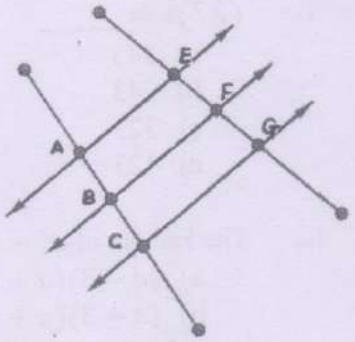


a) 80°
b) 90°
c) 45°
d) 70°

viii. Distance of the point $P(-8,15)$ from the origin is

a) 17 units
b) 15 units
c) 14 units
d) 12 units

ix. In the figure given alongside $AB||BF||CG$, $AB = BC$ and $EF = 4\ cm$, then EG = ____



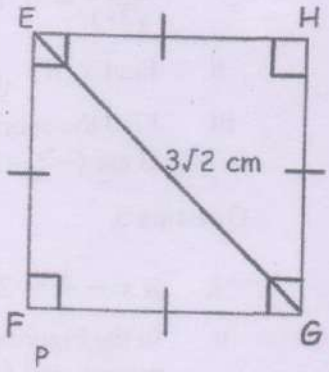
a) $8\ cm$
b) $4\ cm$
c) $6\ cm$
d) $9\ cm$

x. If $4x + 2y + z = 0$ then the value of $64x^3 + 8y^3 + z^3 =$ _____

a) $24xyz$
b) $42xyz$
c) $64xyz$
d) $12xyz$

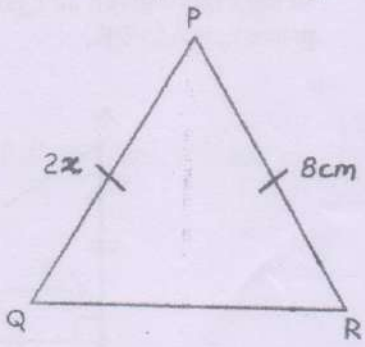
xi. If $\square EFGH$ is a square and length of the diagonal $EG = 3\sqrt{2}\ cm$, then the length of the side of the square is _____.

a) 3 cm
b) 5 cm
c) 6 cm
d) 2 cm



xii. In $\Delta PQR, PQ = PR$ and $PQ = 2x, PR = 8\ cm$, then the value of x is.

a) 2 cm
b) 8 cm
c) 4 cm
d) 16 cm



xiii. In the expansion of $(2x + 1)(3x + 2)$ the coefficient of x^2 is

a) 2
b) 3
c) 6
d) 1

xiv. If $\frac{1}{7^y} = 49$, then $y =$ ____

a) 2
b) -2
c) 3
d) -7

xv. Rationalizing the denominator for $\frac{3}{2\sqrt{3}}$ will give

a) $\frac{\sqrt{3}}{2}$
b) $\frac{2\sqrt{3}}{3}$
c) $\frac{\sqrt{2}}{3}$
d) $\frac{\sqrt{6}}{2}$

Question 2

i. Find the value of 'a' and 'b' if
$\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$ [4]

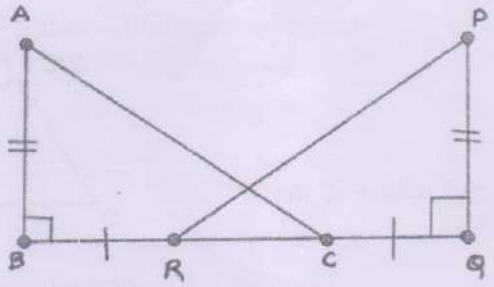
ii. Find x, if $\sqrt{\frac{2}{3}} = \left(\frac{3}{2}\right)^{1-2x}$ [4]

iii. Find the coordinates of the circumcenter of the triangle EFG, whose vertices E, F and G are $(-2,-3)$, $(-1,0)$ and $(7,-6)$ respectively. [4]

Question 3

i. If $x - \frac{1}{x} = 3$, evaluate $x^2 + \frac{1}{x^2}$ and $x^3 - \frac{1}{x^3}$ [4]

ii. In the Figure given alongside, $AB = PQ$ and $BR = QC$, $AB \perp BC$ and $PQ \perp RQ$ prove that AC=PR. [4]



iii. Find the solution of the simultaneous equation
$y = 2x + 1$
$x + 2y + 3 = 0$
By using graphical Method. [5]

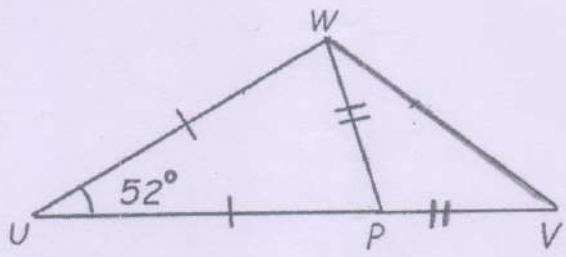
Section B

(Attempt any 4 questions from this section)

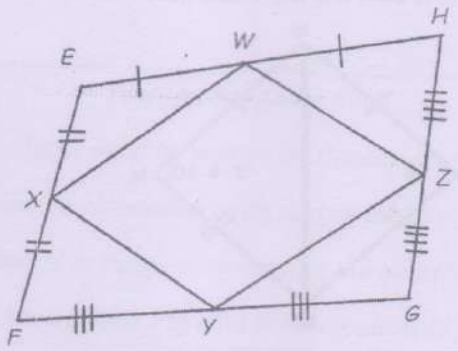
Question 4

i. Use suitable identity to find the value of
a) $(10.3)^2$
b) $(9.4)^2$ [3]

ii. In the figure given alongside, $UW = UP$ and $WP = PV$, $\angle WUP = 52°$
Find.
a) $\angle UWP$
b) $\angle PVW$ [3]



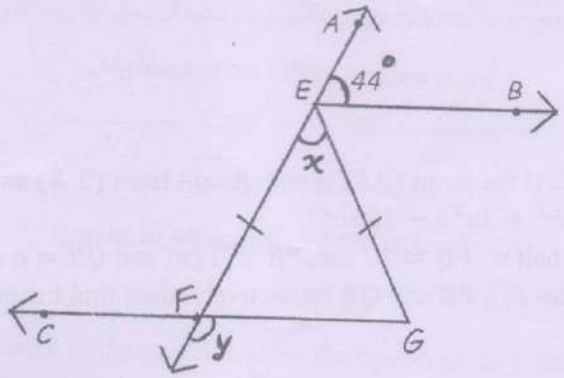
iii. EFGH is a quadrilateral, X, Y, Z, W are the midpoints of the respective sides prove that quadrilateral XYZW is a parallelogram. [4]



Question 5

i. Factorize $3x^2 - 1 - 2x$. [3]

ii. In the adjoining figure, if $\angle AEB = 44°$ and EB || FC, find the value of x and y. [3]



iii. Represent $\sqrt{3}$ on the number line (Use compass and ruler only). (4)

Question 6

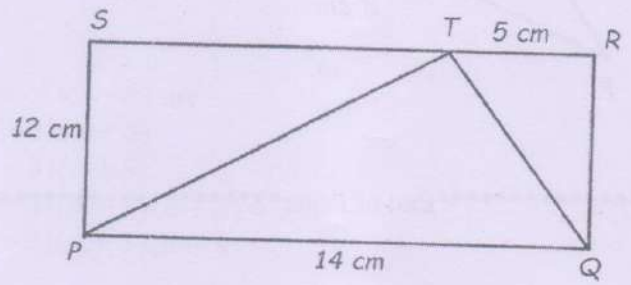
i. If $6^{x+1} = 36^{x-2}$, find the value of $2^{x-3} \times 3^{x-4}$ [3]

ii. Factorize $25(a-b)^2 - 16(c-d)^2$ [3]

iii. In the figure $\square PQRS$ is a rectangle, T is a point on SR such that $TR = 5\ cm$, $PQ = 14\ cm$ and $SP = 12\ cm$ find. [4]

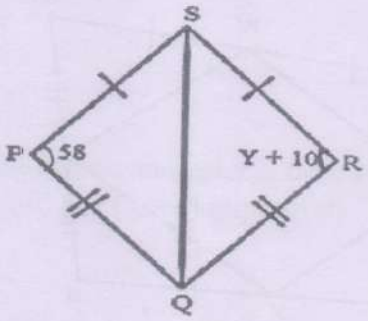
a) PT

b) TQ



Question 7

i. In the figure given below, find out the value of Y [3]



ii. Two poles of heights 18m and 3m stand vertically on a plane ground. If the distance between their tops is 17m, find the distance between their feet. [3]

iii. Solve the following simultaneous equations [4]

$$\frac{15}{x+y}+\frac{3}{x-y}=6$$

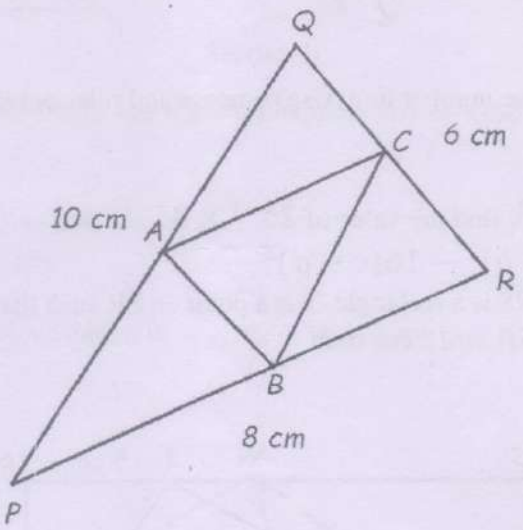
$$\frac{35}{x+y}-\frac{5}{x-y}=2$$

Question 8

i. Find the value of 'k', if the point $(0,2)$ is equidistant from $(3,k)$ and $(k,5)$ [3]

ii. Factorize $a^3-125b^3+3a^2b-15ab^2$ [3]

iii. In the figure drawn below, $PQ = 10\ cm$, $PR = 8\ cm$ and $QR = 6\ cm$, if A, B, C are the midpoints of sides PQ, PR and QR respectively, then find the perimeter of ΔABC. [4]



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