GREENLAWNS HIGH SCHOOL

TERMINAL EXAMINATION 2020

STD X — SUBJECT –MATHEMATICS

TIME 2 HOURS — MARKS -60

(Attempt all Questions)

QUESTION 1

a) Mr. Shah deposits a certain amount every month in a recurring deposit account for 3 years at 8% p.a. If he receives Rs 40,440 at the time of maturity, calculate his monthly installment. (3)

b) Find the equation of a line which divides the segment joining P (-2, 6) and R (3,-4) in the ratio 2:3 and whose slope is -3/2. (3)

c) The table drawn below shows the weekly pocket money given to a group of kids. Find the Mode and also mention the modal class. (4)

Weekly pocket money	50 - 55	55 - 60	60 -65	65 -70	70 - 75	75 - 80
No of kids	6	18	12	9	7	6

QUESTION 2

a) Solve the following inequation and graph the solution on a number line (3)

$2 \leq \frac{x-4}{2} + \frac{x}{3} \leq 3$, where $x \in R$

b) Prove that $(\sin\theta + \text{cosec}\,\theta)^2 + (\cos\theta + \sec\theta)^2 = 7 + \tan^2\theta + \cot^2\theta$ (3)

c) The table drawn below shows marks obtained by a certain number of students in a particular test. Calculate the mean marks correct to 2 significant figures (4)

Marks	0-5	5-10	10-15	5-20	20-25	25-30	30-35	35-40
No of students	3	7	15	24	16	8	5	2

QUESTION 3

a) Using the properties of proportion solve for x (3)

$$\frac{\sqrt{5}+\sqrt{5-x}}{\sqrt{5}-\sqrt{5-x}} = \frac{5}{4}$$

b) If the 5th term of an AP is -1 and the 17th term is -49, find the sum of the 1st 24 terms. (3)

...2/...

c) If $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ & $C = \begin{bmatrix} 0 & -4 \\ 10 & 3 \end{bmatrix}$, then find matrix A such that AB =C. (4)
Also mention the order of A.

QUESTION 4

a) Find p if the following equation has real & equal roots. (3)
$(4-p)x^2 + (2p+4)x + 8p+1 = 0$

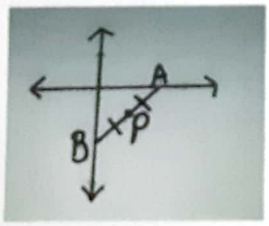
b) Using factor theorem show that x-2 is a factor of $x^3 - 3x^2 - 10x + 24$. Hence mention all its factors. (3)

c) The angle of elevation of the top of a mountain at a certain distance from its base is 45°. (4)
If on moving 10km further from that place, the angle of elevation changes to 30°.
Calculate the height of the mountain. Express your answers to the nearest whole number.

QUESTION 5

a) If $A = \begin{bmatrix} 15 & -8 \\ 6 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ -1 & 3 \end{bmatrix}$, find 2A-3B (3)

b) In the figure drawn below if P(3,-2) is the midpoint of AB, find the coordinates of A and B. (3)



c) In an AP the 3rd term is 17 and the 11th term is 65. If the last term is 119 find the 18th term and also find the number of terms. (4)

QUESTION 6

a) If a:b = c:d, then prove that $\frac{a^4+c^4}{b^4+d^4} = \frac{a^2c^2}{b^2d^2}$ (3)

b) If the median of the following numbers arranged in ascending order is 27, find x and hence find the 4th term. (3)
18, 20, 24, x-2, x, 29, 30, 31

d) The area of a rectangular field is 260m². Had its length been 5m less and breadth 2m more the field would have been in the shape of a square. Find the dimensions of the rectangular field. (4)