

3) a) Graph  $f(x)=2^{x-1}$  where  $x \in [-4, 2]$ . State its range and discuss its monotony  
Also from the graph find:  $f(1.2)$ ,  $\sqrt[3]{8}$ ,  $\log_2 3.5$

b) Solve each of the following:-

i)  $|x + 4| + 3x - 5 = 0$

ii)  $|3x-5| \leq 10$

iii)  $|5 - 2x| > 3$

iv)  $9^{x^2-1} - 36 \times 3^{x^2-3} + 3 = 0$

v)  $(\log x)^2 + \log x^2 = (\log 2)^2 - 1$

c) All terms of a geometric sequence are +ve, its common ratio is less than one and the arithmetic mean of the third and fifth terms equals 30, their geometric mean equals 24. Find the sequence then prove that the sum of any number of terms whatever this number is not more than 384.

4) a) Solve

i)  $2 \log_2 x - \log_2 (x-1) = 2$

ii)  $3^{2x-4} = 9^{2x-2}$

iii)  $\log \sqrt[3]{3x-1} + \log \sqrt[3]{3x+1} = \log 20 - 1$

iv)  $7^{2x} + 9 \times 5^{2x} = 5^{2x} + 9 \times 7^{2x}$

b) G.S in which  $T_1 + T_2 = 9$  and  $T_6 + T_7 = 288$ . Find the sequence and the sum of the first eight terms and the order of term whose value equals 384.

c) Three numbers form G.S their sum equals 35. If one is subtracted from the first, Two from the second and eight from the third they will form A.S. Find these three numbers.