## Assignment! Mathematics Assignment

Let R be the set of all real numbers. Using the fact that every cubic equation with real coefficients has at least one real root, show that n -> (23-2) defines a mapping of R is one-one or not

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· 1 / Lating 3-1 Hamle 2018 ing its in let, y E R s.+ fcn) = y Herr, for = n3-x So, 23-22 = y =) 23-x-y=D

for, any real value of y the equation 23-11-y=0 has is a cubic equation with real coefficients has at least a Koot real root.

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The f is onto this man have a mark the second will not all the second with the second will be a second with the s

let, x,,xz ER

F(xi), f(xz) ER f(-1) = -1+1 =0 M, (x,-W) S.t. f(x1) = f(x2) and x, tx2 x, (x4-1) (x4-1) (x,-x)(x,2n,n,2) =  $\chi^3 - \chi = \chi^3 - \chi_2$ ラ パラツ2 = パーソ2 ) (n,-x2)(n,2-n,x2+x2) =(n/n2) (as x, # 2)  $= \frac{2}{\pi^2 - \chi_1 \chi_2 + \chi_2} = 1$ Herr, for many value of x ER the fine there exists same for ER. So, f is not one to one. a finite extra sales with being more and in the court of the and more Read months of the state of Lul-sin nissila 1 1 of the start of and way to draw they are shally as is will. The same of the Court of the balance the transfer construct a set ray day. Many of material days - let was - at materials with with the

- 2. Prove that cyclic group must be an abelian group.
- let. G be a cyclic group and a bea generator G so that

6 = {an: n = 71}

let, ga g, and g, are any two elements of G

 $\exists r, s \in \mathbb{Z} \quad s+ \cdot \cdot \cdot \cdot \cdot s = a^r \quad and \quad g_2 = a^s$ 

: 9,92 = ar. as = ar+s.

= as+x

= a = a = 9,9, +9,-9,6

· G is abelian.

3. Find the edge connectivity of the complete graph with a vertices.

number of edges that need to be removed to make the graph disconnected.

This is a complete graph with in vertices (denoted by kin) that means —

i. each vertex is connected to every other vertex.

ii. So, the degree of each vertex is (n-1)

So, we need to remove at least (n-1) degrees.

So, the edge connectivity is  $\lambda(k_n) = n-1$ .

4. How many squares are there in a chess board? Explain your answer.

We know a chess board is 8x8 in Size, so if we think that in 8x8 we have 64 squares.

So, we can partitioned the chess board, means 8 boxes in different parts.

 $\frac{5ay}{2 \times 2} = \frac{1}{4} \frac{1}{60 \times 2}$  $\frac{2 \times 2}{3 \times 3} = \frac{9}{60 \times 2}$ 

we took I box as unit So, with 3 unit we can form 9 boxes.

4x4 = 16 boxes

5 x 5 = 25 boxes

6×6 = 36 boxes

7 x7 = 49 boxes

8x8 = 64 boxes

We cannot go further because the chess board is of 8x8.

So, the sum is = 1+4+9+ -- +49+64 = 204

. Total squares in a chess board is 204.