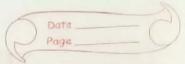
Mutomata and formal language Tutorial -2 U20CS 110 Krishra Pandey Prove by Mathematical induction Quest let S(n) = 1+2+ - n, nEN

Prove by M. I P(n): S(n) = n(n+1) sd-S(N) = 1+2+ -- - n , NEN let n=1 S(n)= n(H)) S(n) = 1 S(N) = 1(2)=1 L.M.S = R.M.S true for n=1 let it true for n= K S(K) = 1+2+ - · K = K(K+1) Now will prove for n= K+1 S(K+1) = 1+2+ - +K+K+1 2 K(K+1) + K+1 $= (k+1) \left[\frac{k+2}{2} \right]$ L-H-S = (K+1) (K+2) R.M.S. S(K+1) = (K+1) (K+2) pence proved L.M.S = R.M.S



	S- Liventy
(2)	S(n) = 1+3+5+(2n-1)
	prove by MI S(n) = 12
	The state of the s
	Let SA
	to prove) $S(n) = 1+3+5+ (2n-1) = n^2$
	the state of the s
	5(1) = 1 = 1 true for n=1
COLOR	true for 11=)
1 10	Let it true for n= K
1 4	
	S(K) - 1+3+5+ (2K-1) = K2-0
	Now will prove it for n= k+1
	De and best to the second
L.M.S =	S(K+1) = 1+3+5+(2K-1)+(2K+1)
	= K2 + (2K+1)
	= (K+1) 2
	1+3+3+ 45+1 -11+333
	= R. M.S
	Hence proved
3	Prove by MI that (2n)2 - n(2n+1)(7n+1)
	$(N+1) = + (N+2)c + \dots $
	for all ne N
	College Court of College
	711.9 211.1



(U+1)5 + (U+5)5 + (U+U) 5 - U (SU+1) (5W) L. M.S = 22 = 4 R.M.S - 1(2+1)(7+1) = 4 L.M.S = R.M.S tunce true for n=1 (K+1)2+(K+2)2. ... (2K)2 = K(2K+1)(3K+1) Now will check for n= K+1 (K+1)2+ (K+2)2+ -- BK)3+ (5K+5)5 = (K+1)(2K+3)(7K+8)(-M·S= (K+1)2 + (K+2)2 + - (2K)2+(2K+2) = K(2K+1) (7K+1) + (2K+2)2 = 1 [K[14K2+9K+1]+ 24[K2+1+2K])

= 1 [14k3 + 33k2 + 49k+24)



 $= \frac{1}{6} (k+1) (2k+3) (7k+8)$

= R. M. S

Mence provid

0 m/2 - 4 brox ph WI 1. U + 5. (U-1) + 3. (U-5) + (U-1).5 + U·1

= 1 U (U+1) (U+5) for AUEN

Sol- > let n=1

1 = 1 (2)(3)

1=1

true for n=1

let it true for n= K

1. K + 2. (K-1) + 3 (K-5)+--- (K-D2+K.)

= T K (K+D(K+S)

Now will prove for n= K+1

1.(K+1) + 2-(K) + 3(K-1) + -- K.2+(K+1)1+

= 1(K+1)(K+2)(K+3)

S(K+1) - S(K) = U(U+1) + (U+1)

 $= \underbrace{(n+1)}_{2} (n+2)$

s(K+1)= (K+1)(K+2) + s(K) = (K+1)(K+2) + K(K+1)(K+2) = (K+1) (K+2) [3+K] = (K+1) (K+2) (K+3) = R.H.S Hence provid Prove by M. I n(n+1)(n+2)(n+3) is divisitly by 24. 501-P(n) = p(n+1)(n+2)(n+3)for n=1 P(1) = 1(2)(3)(4)clearly P(1) divisitle by 24 - Let P(K) is divisitly by 24 P(K) - K (K+1) (K+2) (K+3) = 24t Now will prove P(K+1) is divisitly

