Mathematical Induction

let s(n) denote a mathematical that shrother one or more occurrences of the Variable 11, which represents a positive integer, as If soo is force ome for some in (d) I remaind for some

0

particular, but arbitrarily chosen & Ext, S(\$+1) is also true, then s(n) is true for all

n モ ス^{+.}

1. Proce by mathematical widuction, that 1+2+3+--+ 1= 1(0+1) 171

let S(n)= 1+2+3+--+n = n(n+1) n7,1.

Initial Step or Basis step S(1) = 1 = 1 (1+1)

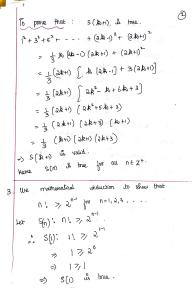
: \$(1) is true & Box

assume that S(k) is true. i.e S(b) = 1+2+ -- + b = b(k+) To prove that: \$ (k+1) is bove. 1+2+3+ -- + k+ k+1 = k(k+1) + (k+1) = (b+1)(k+2) عن (امط) عن valid S(n) is there for all next. 1771. 2. Power by mathematical induction that

12+32+52+ -- + (2n-1)2 = 13 n (2n-1) (2n+1). $||g_{1}||^{2} + ||g_{1}||^{2} + ||g_{1}||^{2$ S(1): 12 = = = X1 x1 x3

=) S(i) is home. assume S(18) is bue.

12+32+52+ -- + (a/k-1)2= = = = = = (a/k-1)(2/k+1).



let us assume \$(K) is bose. i.e le! > 2k-1-0 ~ To prove that: S(1/2+1) is home. Now (k+)! = (k+1) &! > (k+1) 2k-1 by 0) 7 2. 2 Kd Since K+172 = 2 K. kn 272 =) S(k+1) is also toue. Hence SCD is toue for n=1,2,3,... 4. Use mathematical unduction to prove that n3+an is divisible by 3, for n2/1. Let S(n): (n3+an) us divisible by 3. : S(1): 13+2.1 = 1+2 =3 is dissible by 3, which is true. Let us comme s(k) is bue. R3+2le in divisible by 3 w To prove that: S(k+1) is bour.