

No.	SOLUTION	MARKS
1	<p>Let <math>P_n</math> be the statement <math>\sum_{k=1}^n (2k-1) = n^2</math></p> <p>STEP 1: Prove that <math>P_1</math> is true.  When <math>n = 1</math>, LHS = <math>2(1) - 1 = 1</math>  and RHS = <math>(1)^2 = 1</math>  Hence LHS = RHS.  Therefore <math>P_1</math> is true.</p> <p>STEP 2: Assume that <math>P_n</math> is true for an arbitrary <math>n \in \mathbb{Z}^+</math>.  <math>P_n: \sum_{k=1}^n (2k-1) = n^2</math></p> <p>STEP 3: Prove that <math>P_{n+1}</math> is true.  <math>P_{n+1}: \sum_{k=1}^{n+1} (2k-1) = (n+1)^2</math>  <math>L.H.S. = \sum_{k=1}^{n+1} (2k-1)</math>  <math>= \sum_{k=1}^n (2k-1) + 2(n+1) - 1</math>  <math>= (n)^2 + 2(n+1) - 1</math>  <math>= n^2 + 2n + 1</math>  <math>= (n+1)^2</math></p> <p>Hence <math>P_n</math> is true implies <math>P_{n+1}</math> is true. Since <math>P_1</math> is true, it follows by the principle of mathematical induction that <math>P_n</math> is true for all <math>n \in \mathbb{Z}^+</math></p>	<p>1</p> <p>1</p> <p>1</p> <p>2</p> <p>2</p> <p>3</p> <p>2</p> <p>2</p> <p>1</p>