**Question 1:** Using the principle of mathematical induction, prove that

1² + 2² + 3² + ..... + n² = (1/6){n(n + 1)(2n + 1} for all n ∈ N.

**Question 2:** By using mathematical induction prove that the given equation is true for all positive integers. 1 x 2 + 3 x 4 + 5 x 6 + …. + (2n - 1) x 2n = (n(n+1)(4n−1))/3

**Question 3:** Using the principle of mathematical induction, prove that

1 ∙ 2 + 2 ∙ 3 + 3 ∙ 4 + ..... + n(n + 1) = (1/3){n(n + 1)(n + 2)}

**Question 4:** By using mathematical induction prove that the given equation is true for all positive integers. 2 + 4 + 6 + …. + 2n = n(n+1)

**Question 5:** By using mathematical induction prove that the given equation is true for all positive integers. 2 + 6 + 10 + ….. + (4n - 2) = 2n2

**Question 6:** Using the principle of mathematical induction, prove that

1/(1 ∙ 2) + 1/(2 ∙ 3) + 1/(3 ∙ 4) + ..... + 1/{n(n + 1)} = n/(n + 1)

**Question 7:** Using the principle of mathematical induction, prove that

{1/(3 ∙ 5)} + {1/(5 ∙ 7)} + {1/(7 ∙ 9)} + ….... + 1/{(2n + 1)(2n + 3)} = n/{3(2n + 3)}.

**Question 8:** By induction prove that 3n - 1 is divisible by 2 is true for all positive integers.

**Question 9:** Using the principle of mathematical induction, prove that

1/(1 ∙ 2 ∙ 3) + 1/(2 ∙ 3 ∙ 4) + …….. + 1/{n(n + 1)(n + 2)} = {n(n + 3)}/{4(n + 1)(n + 2)} for all n ∈ N.

**Question 10:** By induction prove that n2 - 3n + 4 is even and it is true for all positive integers.