## By using mathematical induction show that:

1. $1^2 + 2^2 + 3^2 + \ldots + n^2 = n(n+1)(2n+1)/6.$

2. $1 + 4 + 7 + \ldots + (3n-2) = 1/2 \, n(3n-1).$

3. $\dfrac{1}{1x3} + \dfrac{1}{3x5} + \cdots + \dfrac{1}{(2n-1)(2n+1)} = \dfrac{n}{2n+1}.$

4. $(1)(2) + (2)(3) + \ldots + n(n+1) = \dfrac{n(n+1)(n+2)}{3}.$

5. $2 + 4 + 6 + \ldots + 2n = n(n+1).$