10. Prove by induction that, for $n \in \mathbb{Z}^+$

$$\sum_{r=1}^{n} r^2(2r-1) = \frac{1}{6}n(n+1)\left(3n^2+n-1\right)$$

(5)

(Total for Question 10 is 5 marks)

TOTAL FOR PAPER IS 75 MARKS