Induction Worksheet

Complete the following proofs on a separate sheet of paper.

1) Write the first few terms, suggest and prove an explicit formula for a_n.

$$a_1 = 1; a_n = 2a_{n-1} + 1$$

2) Write the first few terms, suggest and prove an explicit formula for a_n.

$$a_1 = \frac{1}{4}; a_n = a_{n-1} + \frac{1}{(3n-2)(3n+1)}$$

3) Write the first few terms, suggest and prove a formula for S_n.

$$\sum_{a=1}^{n}(4a-2)$$

4) Prove: $\displaystyle\sum_{a=1}^{n} a^3 = \left(\frac{n(n+1)}{2}\right)^2$