Practice worksheet | Mathematical induction

Constructing the induction step

Name: _____ Date: _____

6 questions | 14 marks

1. Simplify $k^2 + 2k + 1$ and explain its induction use. [2 marks]

2. Given $S_k = \frac{k(k+1)}{2}$, derive S_{k+1} when the next term is $k+1$. [3 marks]

3. What term extends $\sum_{r=1}^{k} r^2$ to the sum ending at $k+1$? [1 mark]

4. If $\prod_{r=1}^{k} \frac{r+1}{r} = k+1$, find the next product. [3 marks]

5. A student writes the target at $k+1$ immediately after the hypothesis at k. What is missing? [2 marks]

6. For $A_n = 5^n - 1$, establish $A_{k+1} = 5A_k + 4$. [3 marks]