Practice worksheet | Sequences and series

Introduction to proof by induction

Name: _____ Date: _____

6 questions | 16 marks

1. Check the base case for $1 + 2 + \cdots + n = n(n + 1)/2$. [2 marks]

2. State the induction hypothesis for the same identity. [2 marks]

3. Complete the induction step for the same identity. [3 marks]

4. A student checks $n = 1, 2, 3$ and concludes an identity holds for every positive integer. Identify the missing argument. [2 marks]

5. Prove $2 + 4 + \cdots + 2n = n(n + 1)$ by induction. [4 marks]

6. Why is an induction step alone insufficient for $1 + 2 + \cdots + n = n(n + 1)/2 + 5$? [3 marks]