Mathematical Induction

Name _____

Date _____ Period _____

Mathematical Induction is a process for proving statements involving natural numbers (positive integers: 1, 2, 3, 4, ...).

Statement: The sum of the first n odd integers equals n^2.

$n = 1$

$n = 2$

$n = 3$

$n = 4$

For Mathematical Induction two conditions must be satisfied.

✓ Condition 1: The statement must be true for the natural number 1, $n = 1$.

Condition 2: Assume the statement is true for the natural number k, prove it is true for the natural number $k + 1$.

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Statement: The sum of the first n odd integers equals n^2.

Let $n = k$

Let $n = k + 1$

Statement: The sum of the first n even integers equals $n(n + 1)$.

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Let $n = k$

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Statement: $1 + 5 + 9 + \ldots + 4n - 3 = n(2n - 1)$

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Let $n = k$

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Statement: $n^2 + n$ is divisible by 2.

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