

Discrete Mathematics

Induction and Recursion

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More Examples of Mathematical Induction

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Example 1

Prove that for $n \geq 4$, $2^n \geq 3n$.

Divisibility

Definition. For two integers a and b , if $a = bm$ for some integer m , then we say ***a is divisible by b*** or ***b divides a*** . We write $b|a$.

Examples.

1. $3|216$.
2. 5 does not divide 12.
3. Even numbers are those divisible by 2.

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Example 2

Prove that $4 \mid (3^{2n} - 1)$ for all $n \in \mathbb{N}$.

Example 3

Prove that for $n \in \mathbf{N}$, $n^2 + n$ is an even number.