Divisibility

Lecture 4

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Outline

1. Divisibility
2. LaTeX
3. Divisibility Conjectures

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Divisibility

Definition (Divisibility)

Let n and m be integers. Then n **divides** m, written $n \mid m$, if $n \neq 0$ and there is an integer k such that $nk = m$.

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1. Divisibility
2. LaTeX
3. Divisibility Conjectures

LaTeX

- Use `\mid` to create the "divides" sign $\mid$.
- Use `\nmid` to create the "does not divide" sign $\nmid$.

Examples:

- $3 \mid 6$
- $4 \nmid 6$

Outline

1. Divisibility
2. LaTeX
3. Divisibility Conjectures

Conjecture

Problem

Prove or disprove: For any integer n, $n \mid 0$.

Conjecture

Problem

Prove or disprove: For any nonzero integer n, $n \mid 0$.

Conjecture

Problem

Prove or disprove: For any integer n, $1 \mid n$.

Conjecture

Problem

Prove or disprove: For any integer a, if $a \mid 1$, then $a = 1$ or $a = -1$.

Conjecture

Problem

Prove or disprove: For any integers a and b, if $a \mid b$ and $b \mid a$, then $a = b$ or $a = -b$.

Conjecture

Problem

Prove or disprove: For any integers a, b, and c, if $a \mid b$ and $a \mid b + c$, then $a \mid c$.

Conjecture

Problem

Prove or disprove: For any integers a, b, and c, if $a \nmid b$ and $a \nmid c$, then $a \nmid b + c$.

Conjecture

Problem

Prove or disprove: For any integers a, b, and c, if $a \mid b$ and $a \nmid c$, then $a \nmid b + c$.

Conjecture

Problem

Prove or disprove: For any integers a, b, and c, if $a \mid c$ and $b \mid c$, then $a + b \mid c$.