

- 1d.** Find the greatest common divisor of 314 and 159.
- 3.** If $a \mid b$ and $b \mid c$, prove that $a \mid c$.
- 10.** Prove that $\gcd(n, n + 1) = 1$ for every integer n .
- 16.** If $\gcd(a, b) = d$, prove that $\gcd\left(\frac{a}{d}, \frac{b}{d}\right) = 1$.
- 17.** If $a \mid c$ and $b \mid c$, must ab divide c ? What if $\gcd(a, b) = 1$?
- 20.** Prove or disprove each of the following statements.
- (a) If $2 \nmid a$, then $4 \mid (a^2 - 1)$.
- (b) If $2 \nmid a$, then $8 \mid (a^2 - 1)$.
- 21.** Prove that $\gcd(a, a + b) = d$ if and only if $\gcd(a, b) = d$.
- 25.** (Bonus) Use induction to show that if $\gcd(a, b) = 1$, then $\gcd(a, b^n) = 1$ for all $n \in \mathbb{N}$.