

Section 5.1

- 5.2** Disprove the statement: If $n \in \{0, 1, 2, 3, 4\}$, then $2^n + 3^n + n(n-1)(n-2)$ is prime.
- 5.4** Disprove the statement: Let $n \in \mathbb{N}$. If $\frac{n(n+1)}{2}$ is odd, then $\frac{(n+1)(n+2)}{2}$ is odd.
- 5.6** Let $a, b \in \mathbb{Z}$. Disprove the statement: If ab and $(a+b)^2$ are of opposite parity, then a^2b^2 and $a+ab+b$ are of opposite parity.
- 5.8** (a) Prove: For positive real numbers a and b , $(a+b)(1/a + 1/b) \geq 4$.
- (b) Does (a) imply that $(c^2 + d^2)(1/c^2 + 1/d^2) \geq 4^2$ for every two positive numbers c and d ?
- (c) Does (a) imply that $(c^2 + d^2)(1/c^2 + 1/d^2) \geq 4$ for every two positive numbers c and d ?