MH1812 Tutorial
Chapter 4: Proof Techniques

Q1: Let q be a positive real number. Prove or disprove the following statement: if q is irrational, then $\sqrt{q}$ is irrational.

Q2: Prove using mathematical induction that the sum of the first n odd positive integers is n^2.

Q3: Prove using mathematical induction that $n^3 - n$ is divisible by 3 whenever n is a positive integer.

Q4: Prove by mathematical induction that

$$1^2 + 2^2 + \cdots + n^2 = \frac{1}{6}n(n+1)(2n+1)$$