

Practice for assessment: Geometry, Proof and Systems of Equations
Geometry, Proof and Systems of Equations Assessment Standard 1.5

1. For real numbers a and b it is conjectured that:

$$\frac{a}{b} > 1 \Rightarrow a > b.$$

Disprove the conjecture by providing a counter example.

2. Prove by contradiction that, for a natural number, n , if $5n$ is odd then n is odd.
(Start by assuming that $5n$ is odd with n even.)
3. Prove by contradiction that if $2x$ is irrational then x is irrational.
4. Provide a direct proof to show that $n^2 + 3n$ is divisible for 2 for all natural numbers, n .
5. Are the following results true or false? If true, provide a proof or if false, a counter example.
- $n^3 - n$ is always divisible by 6.
 - $n^3 + n + 5$ is always prime.