

Tutorial Week 7

Define an integer n is even if $n = 2k$ and odd if $n = 2k + 1$

1. Prove if n is an odd integer, n^2 is odd
2. Prove if m and n are perfect squares, then $m \cdot n$ is also a perfect square
3. Prove if n is an integer, and $3n + 2$ is odd, then n is odd
4. Prove if n is an integer and n^2 is odd, then n is odd
5. Show p , at least 4 of any 22 days, must fall on the same day of the week
6. Prove that $\sqrt{2}$ is irrational

This is the extent of problems completed in most tutorials

7. Show these statements are equivalent

p_1 : n is even

p_2 : $n - 1$ is odd

p_3 : n^2 is even

$p_1 \rightarrow p_2, p_2 \rightarrow p_3, p_3 \rightarrow p_1$

8. Prove that if a and b are real numbers, $a \neq 0$, then there is a unique real number r s.t. $ar + b = 0$

9. Prove that if m is a perfect square, $m + 2$ is not a perfect square

10. Prove that if x^3 is irrational, x is irrational.