

Tutorial Worksheet 5

1) **There are infinitely many prime numbers.** This is Theorem 3.6.6 of the course note.

- a) Make sure the proof of it is clear. What type of proof is used?
- b) Is it possible to use other two types of proof to prove it. Discuss.

2) (a) Write the following statement using mathematical symbols.

For any positive real number x , there is natural number n , for which $\frac{1}{n} < x$.

(b) Using mathematical symbols write the negation of the above statement. Your answer should not include \neg .

(c) Which one of the statements in parts (a) or (b) is true?

3) Prove that the equation $x^3 + x + 1 = 0$ have no rational solutions.