

Practice Exam 3

1. For each of the following statements, write the first sentences of a proof by contradiction (you should not attempt to complete the proofs).
 - (a) $\sqrt{2}$ is an irrational number.
 - (b) If $a > 1$, then $a^2 > \sqrt{a}$.
 - (c) For all real numbers x , $x^2 \geq 0$.
 - (d) If n is a multiple of 4 then $n + 2$ is not a multiple of 4.
2. Prove that if x is a real number then $x^2 \geq 0$ (you may use that for a, b, c real numbers, if $a > b$ then ($ac > bc$ if $c > 0$ and $ac < bc$ if $c < 0$)).
3. 51 small insects are in a square of 1×1 . Prove that at least three insects are inside a circle of radius $1/7$.

The following are exercises I suggest from the Chapter 5 Self Test

(Note: The solutions of the self-test are in the back of the book.)

4. 1
5. 2
6. 5
7. 8
8. 12
9. 16