

Homework: #4, Class #4

Discrete Mathematics (Course Number: MTH-129-51)

Prof. G. Safko

Due: Class #5

Prove the following by direct proof, or disprove by proof by contradiction:

$$\forall x, y \in \{\text{Irrationals}\}, xy \in \{\text{Irrationals}\}$$

$$\forall x \in \{\text{Negative Real Numbers}\}, x^2 > x$$

$$\exists x \in \{\text{Primes}\}, \exists y \in \{\text{Fibonacci Numbers}\}, x = y$$

$$\exists x, y \in \{\text{Primes}\}, \exists n \in \{\mathbb{Z}^{\text{odd}}\}, n = xy \text{ and } x \neq y$$

Write your own predicates $P(x)$, and $Q(x)$ than can satisfy the following:

$$\forall x, \text{ if } P(x), \text{ then } Q(x)$$

$$\forall x, \text{ if } \sim Q(x), \text{ then } \sim P(x)$$

$$\exists x, \text{ if } P(x), \text{ then } Q(x)$$

$$\exists x, \text{ if } \sim Q(x), \text{ then } \sim P(x)$$