

Worksheet 4 Solution

March 13, 2020

Question 1

- a. $\exists n \in \mathbb{N}, (n > 3) \wedge (n^2 - 1.5n \geq 5)$
- b. The variable is existentially quantified
- c. Concrete natural number
- d. Let $n = 5$.

Then,

$$(5)^2 - 1.5(5) \tag{1}$$

Then,

$$25 - 7.5 \tag{2}$$

Then,

$$17.5 \tag{3}$$

which is greater than 5. So, the statement is True

- e. $\forall n \in \mathbb{N}, n > 3 \Rightarrow n^2 - 1.5n > 4$

Here \Rightarrow should be used because $n > 3$ is a given, and we are using it to show that the statement $n^2 - 1.5n > 4$ is True

- f. The variable is universally quantified
- g. In this proof the variable must be **arbitrary** natural number
- h. The assumption made is that the any number greater than 3 satisfies the statement $n^2 - 1.5n > 4$.

This assumption is made since the predicate logic is the proof of an implication