Math 270 - Basic Discrete Mathematics
Practice Quiz on Section 3.3

Solutions

Directions: Answer the problems given below.

1. The following statement is true: "$\forall x \in \mathbb{R}^+, \exists y \in \mathbb{R}^+$ such that $xy = 100$." For each value of x given below, find an exact value of $y \in \mathbb{R}^+$ which makes the predicate "$xy = 100$" true.

a. $x = 10$

$y = 10 \Rightarrow xy = 10 \cdot 10 = 100$ ✓

b. $x = 4$

$y = 25 \Rightarrow xy = 4 \cdot 25 = 100$ ✓

c. $x = 7\pi$

$y = \frac{100}{7\pi} \Rightarrow xy = (7\pi)\left(\frac{100}{7\pi}\right) = 100$ ✓

2. Let C be the set of students in your Math 270 class, S be the set of all songs ever recorded, and let $H(c, s)$ be the predicate "student c has heard song s". Rewrite each of the following as a sentence without using the symbols $\forall$ or $\exists$, and without using variables.

a. $\forall c \in C, \exists s \in S$ such that $H(c, s)$.

Every student in my class has heard a song.

b. $\exists s \in S$ such that $\forall c \in C, H(c, s)$.

There is a song that every student in my class has heard.