MATH 210 Discrete Math – Session 8

1) Give the truth value of each quantified statement.

a. $\exists x \in \mathbb{R},\ x + 3 = 0.$
b. $\forall x \in \mathbb{R},\ x + 3 = 0.$
c. $\forall y \in \mathbb{R},\ y^2 + 1 > 0.$
d. $\forall x \in \mathbb{R}\ \forall y \in \mathbb{R},$ if $xy = 0$ then $x = 0$ or $y = 0.$
e. $\forall x \in \mathbb{R}\ \exists y \in \mathbb{R},\ xy = 1.$
f. $\exists y \in \mathbb{R}\ \forall x \in \mathbb{R},\ xy = y.$

2) Translate each of the above statements from formal to informal language.

3) Translate each of the statements below from informal to formal language.

a. All integers are rational numbers.
b. No prime numbers are even.
c. There is no largest integer.
d. There is a non-negative real solution for $x^2 + 2x = 0.$
e. Everybody loves somebody.

4) Write formal negations for the statements in item 1 above.

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

5) Write negations for each of the following:

a. Everybody loves somebody.

b. $\forall x \in \mathbb{R}^+\ \exists y \in \mathbb{R}^+\ \ x < 1/y$