<u>Ex</u>: Consider the following statement:

$$\forall \text{ integers } n, n \text{ is a real number.}$$

Which of the following statements are equivalent ways of expressing this statement?

(a). Every integer is a real number.

(b). Some of the real numbers are integers.

(c). Any real number is an integer.

(d). All numbers that are integers are real numbers.

(e). Among all the integers, some are real numbers.

<u>Ex</u>: Consider the following statement:

$$\exists \text{ students } x \text{ such that } x \text{ is a mathematics major.}$$

Which of the following statements are equivalent ways of expressing this statement?

(a). Some students are mathematics majors.

(b). Some student is a mathematics major.

(c). The student x is mathematics major for some student x.

(d). If x is a student, then x is a mathematics major.

(e). There is at least one student who is a mathematics major.

(f). Each student is a mathematics major.

<u>Ex</u>: Rewrite the following statement so that the quantifier trails the rest of the sentence.

$$\text{For any real number } x, x^2 \geq 0.$$

A Universal Conditional Statement is of the form:

$\forall x \in D$, if $P(x)$ then $Q(x)$. OR

<u>Ex</u>: Rewrite the following statement informally w/o quantifiers or variables in at least 3 ways:

$\forall x \in \mathbb{R}$, if $x < 0$ then $|x| > 0$.

- The absolute value of any real number less than zero ________________________ .

<u>Ex</u>: Write the following statment formally in the form $\forall$ ___, if ___ then ___.

(a). If a real number is an integer, then it is a rational number.

ANS:

(b). All stoplights are red.

ANS:

See notes for additional material.

Section 3.1, p. 119: #1(a,b,e), 3-11(odd), 13, 14, 16(a, b, c, e), 17(a), 18(a, b, d), 19, 21(a,c), 22(a), 23(a), 24(a), 25(a, c, e), 32, 33