**Assignment 3 – Part 2**

**Exercise Set 6.1 p.378 - 3, 7, 13, 18, 33, 34**

3.a.) No, because there is an element of R that is not in T. For example, 2 is in R but is not in T.

3.b.) Yes, because any integer that is divisible by 6 is also divisible by 2. For example, z=6k for some integer k. z=2(3k) meaning it is divisible by 2.

3.c.) Yes, because any integer that is divisible by 6 is also divisible by 3. For example, z=6k for some integer k. z=3(2k) meaning it is divisible by 3.

7.) Let A={x ∈ Z | x=6a+4 for some integer a}, B={y ∈ Z | y=18b−2 for some integer b}, and C={z ∈ Z | z=18c+16 for some integer c}.Prove or disprove each of the following statements.   
a. A ⊆ B   
**This statement is false because there is an element of A that is not an element in B. For example, let . because there is an integer such that . In this case, However, because there is no integersuch that In this case which is not an integer. Thus but , and so .**  
b. B ⊆ A   
**Proof:   
Suppose n is a particular but arbitrarily chosen element of B. [We must show that . By definition of A, this means we must show that .]  
By definition of B, there is an integer such that [Given that , is there an integer, say a, such that ? Solve for a to obtain .]  
Let . Then is an integer because products and differences of integers are integers.  
Also   
Thus, by definition of A, *n* is an element of A [which is what was to be shown.]**c. B=C  
**Proof that   
Suppose is a particular but arbitrarily chosen element of B. By definition of B, there is an integer *b* such that . [Is there an integer, say *c*, such that Solve for *c* to obtain   
Let Then *c* is an integer because it is the difference of integers.  
Also   
Thus, by definition of *C*, *m* is an element of *C* [which is what was to be shown.]  
  
Proof that   
Suppose is a particular but arbitrarily chosen element of C. By definition of C, there is an integer *c* such that . [Is there an integer, say*****b*, such that Solve for *b*  to obtain   
Let Then *b* is an integer because it is the sum of integers.  
Also   
Thus by definition of *B*, *q* is an element of *B* [which is what was to be shown.]**

13.a.) True  
13.b.) False  
13.c.) False  
13.d.) False  
13.e.) True  
13.f.) True  
13.g.) True  
13.h.) True  
13.i.) False

18.a.) No, because has no elements.  
18.b.) No, because is just an empty set whereas is a set with an empty set inside it.  
18.c.) Yes, is an element inside .  
18.d.) Yes, every set is an element in itself.

33.a.) 33.b.)   
33.c.)

34.a.)

34.b.)

34.c.)