Homework 10

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1)

```
/**
 * Computes {@code a} mod {@code b} as % should have been defined to work.
 *
 * @param a
 *            the number being reduced
 * @param b
 *            the modulus
 * @return the result of a mod b, which satisfies 0 <= {@code mod} < b
 * @requires b > 0
 * @ensures
 *
 *          <pre>
 * 0 <= mod  and  mod < b  and
 * there exists k: integer (a = k * b + mod)
 *          </pre>
 */
public static int mod(int a, int b) {
    assert b > 0 : "Violation of: b > 0";

    int result = a % b;
    if (a < 0 && result != 0) {
        result = result + b;
    }
    return result;
}
```

2) I) <0,90>, <>, <432,-788>, <>, <54,84,-6>,<-195>,<>,<17>,<>,<-101>

```
}

public static int mod(int a, int b) {
    assert b > 0 : "Violation of: b > 0";

    if (a < 0) {
        a = a * -1;
    }
    NaturalNumber number = new NaturalNumber1L(a);
    int digit = 0;
    int newNumber = 1;
    while (!number.isZero()) {
        digit = number.divideBy10();
        newNumber = newNumber * digit;
    }
    int mod = newNumber % b;
    return mod;
}
```

II)

<54,-101,90>,<0>,<84>,<>,<432>,<-196>,<-6>,<17>,<-788>,<>