Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

1. For the function $f : \mathbf{R} \rightarrow \mathbf{R}$ defined as $f(x) = x^3 + 2$, show:

(a) f is One-To-One

(b) f is Onto

Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

2. What is the complexity of the following procedure?

```
PROCEDURE FOO(N: Integer)
NSQUARE = N*N
NCUBED = NSQUARE*N
COUNT = 1
OUT = 0
FOR I = 1 TO NSQUARE
        FOR J = 1 TO NCUBED
                OUT = OUT + I + J
                REMAIN = OUT MOD 2
                IF (REMAIN = 0) THEN COUNT = COUNT + 1
        NEXT J
NEXT I
OUTPUT(OUT, COUNT)
```

Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

3. Find the polynomial big-*O* estimate for the function: $(n^7 \log^2 n + n^{11})(n^3 + 3n\log^2 n)$.

Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

4. Use the Euclidean Algorithm to find GCD(2140, 136)

Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

5. Using the Lemma below, prove that if two Integers divide each other, then they are equal.

Lemma: If the product of two Integers is 1, then the Integers each equal 1.

Name _____

CMSC 203 - Homework Assignment 2 - Due March 30, 2011

6. Using the following Lemma, prove $\sqrt{3}$ is irrational.

Lemma: If *n* is an Integer and 3 divides n^2, then 3 divides *n*.