# CSci 1302 Assignment 11

**Due Friday, April 24th in class**

**Problem 1 (20 points).** Exercises 9, 13 (hint: use the Division by Cases rule - see p. 19), 14, 24, 29 pp. 281-282.
Use the proof methods that we used in class, NOT the element argument given in the textbook.

**Problem 2 (10 points).** Prove each of the following, using the definitions of $O, \Omega$, and $\Theta$:

1. $3x^2 + 3x - 5$ is $O(x^3)$
2. $5x^2 + 5$ is $\Omega(x)$
3. $3x^2 - 7x + 100$ is $O(x^2)$
4. $x - 1$ is $\Omega(1)$
5. 55 is $O(1)$

**Problem 3 (4 points).** Exercises 11 and 13 p. 529.

**Problem 4 (4 points).** Exercise 17 p. 529.

**Problem 5 (2 points).** Exercises 35 and 36 p. 530.

**Problem 6 (2 points).** Exercises 35 and 36 p. 530.

**Problem 7 (4 points).** Prove each of the following, using the definitions of $O, \Omega$, and $\Theta$:

1. $\log_2 x + 3$ is $\Theta(\log_2 x)$
2. $\log_2 x$ is $\Omega(10)$