Problem 1: pp191, #11. Show that $3x^4 + 1$ is $O\left(\frac{x^4}{2}\right)$ and that $\frac{x^4}{2}$ is $O(3x^4 + 1)$:

Hint for 2nd part: under what conditions is $\frac{x^4}{2} \leq 3x^4 + 1$?

Problem 2: pp191, #5. Show that $\frac{(x^2 + 1)}{(x + 1)}$ is $O(x)$:

Problem 3: pp199m #7. Pseudocode for evaluating polynomials $a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_0$ at $x = c$ is given:

```java
procedure polynomial(c, a0, a1, ..., aN: are real numbers)
    power = 1;
    y = a0;
    for (i = 1 to N){
        power = power * c;
        y = y + ai * power // ai = ith a value
    }
    return y;
```

Exactly how many multiplications and additions are used to evaluate a polynomial of degree N at $x = c$? (do not count loop increments). Also can you express this in Big O notation?

Problem 4: Prichard pp 553 #1. How many comparisons of array items do the following loops contain? Can you express that in Big O notation?

```java
int temp;
for (j = 1; j <= n - 1; ++j){
    i = j + 1;
    do {
        if (theArray[i] < theArray[j]) {
            temp = theArray[i];
            theArray[i] = theArray[j];
            theArray[j] = temp;
        } //end if
    } while ( i <=n );
} //end for
```