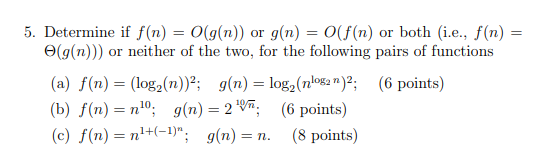
**COMP3121 ASSIGNMENT1 QUESTION5**



**Answer:**

1. We want to show that  we have to show that and

Use .

For we need to show that for some positive c and all sufficiently large n. We take c = is enough to show for all sufficiently large n.

So .

For we need to show that for some positive c and all sufficiently large n. we take c = 1 then is enough to show for all sufficiently large n.

So .

In this case, we can show that .

1. We want to show that f(n) = O(g(n)). We have to show that for some positive c and all sufficiently large n. But, since the log function is monotonically increasing, this will hold just in case

We now see that if we take c = 1 then it is enough to show that

We know that L’Hopital’s rule can replace  with

For all sufficiently large n, we can know that

= 0

In this case for sufficiently large n we have

1. Just note that 1 + (-1)n cycles, with one period equal to {0, 2}

Thus, for all n is even number we have 1 + 1 = 2 and for all n is odd number we have 1 -1 = 0. Thus for any fixed constant c > 0 for all n is even number eventually and for all n is odd number we have

Thus neither nor