Assignment-1 Theory B19071 (1) Yes there is no suggistement for the function in the big - Oh to be dight.

Also, the big - Oh bound sujois to

the cocret-case in put and some inputs

may not elicit the worst case. Solu (0) Yes there is no orequirement for the function in the big - Oh to be tight.
So, coll might say that O (n2) but its possible that all inputs take time O (n) 3 oh (5) salu C Yes, because an algorithm taky (ICn2) in worst case but not on all cases. So it might take o(n) time on some inputs. Foreg, worst case of insertion sort is O(n2) but if the array is already sorted then it will take O(n) dine.

CS-202

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That GCDC a O) or GCDC Da ie a Li.e. a number it self]. => So let us suppose are have 2 positive integers a and b.

The and b are both even then

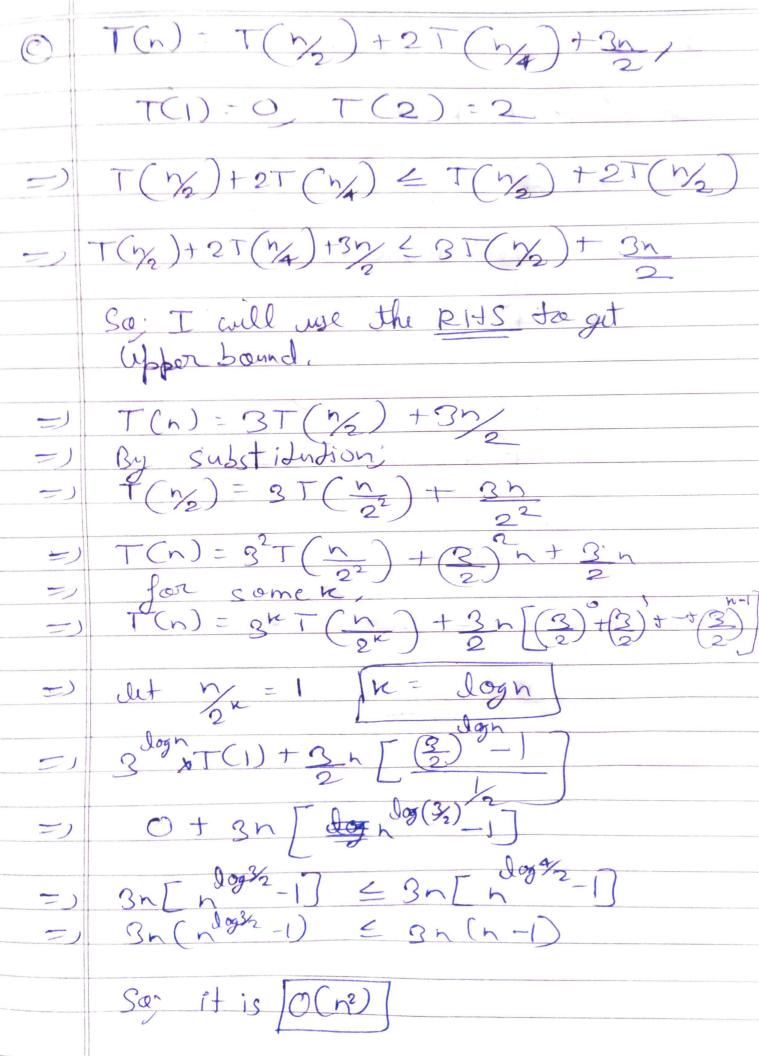
they will definitely has 2 as a common

fact or. So are stone this 2 and

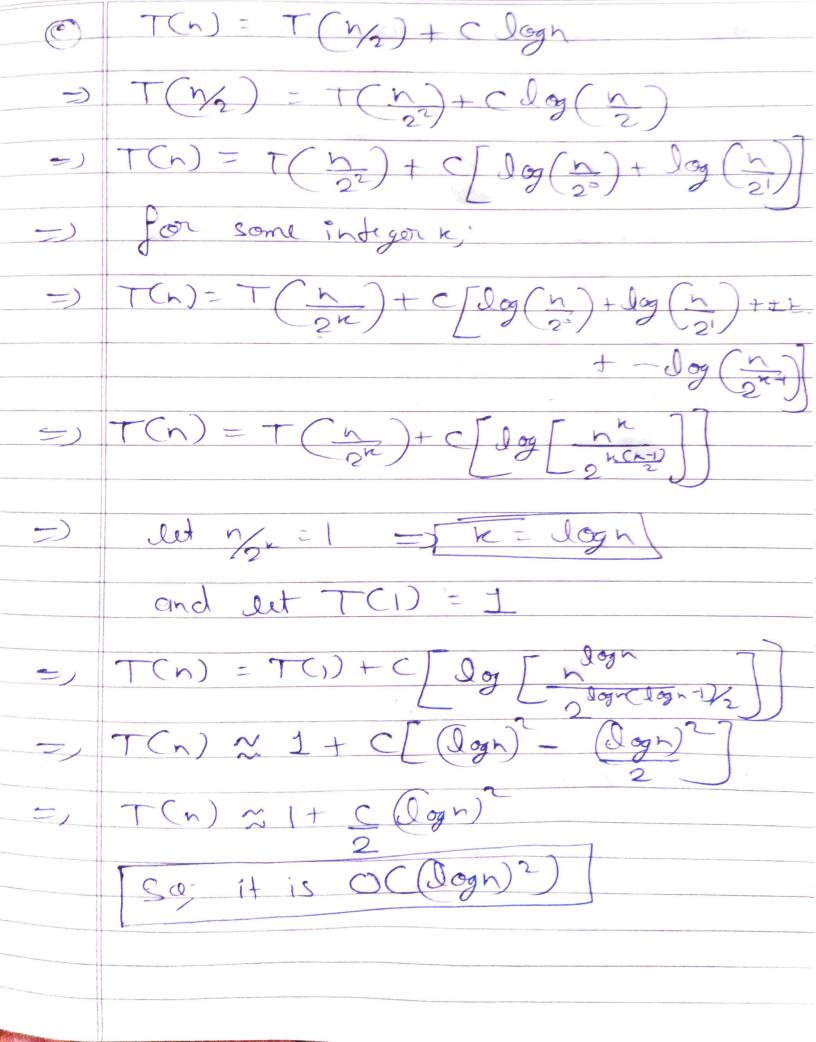
further call for GCD(92 1/2).

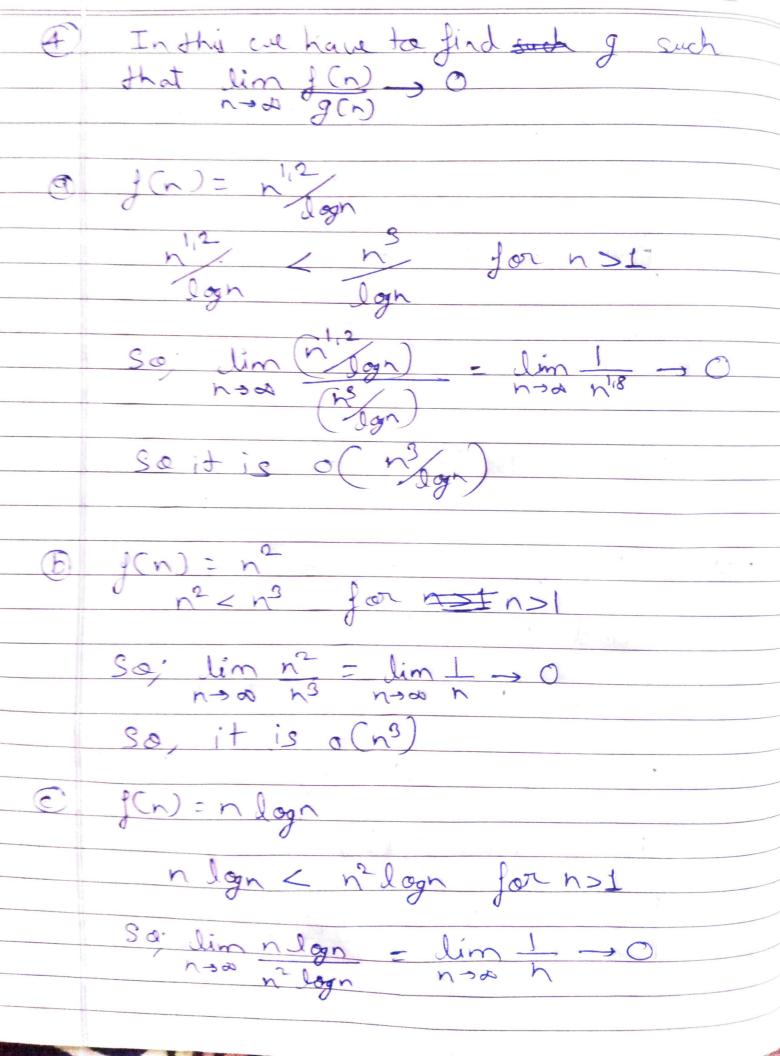
GCD(ab) = 2 * GCD(92 1/2). =) If a is odd and biseven then they do not has 2 as a common factor. So, acocab) = Gco(a b/2). =) If a is even and b is odd then GCD (ab) = GCD (92 b). then, if a is a common factor of a and b. So on divides or on divides by So, a= 2,20 Cfor some 2, ezt)
b=2,20 Cfor some 2, ezt) Also a-5= 2,2-22 => or (2,-22) Soj a divides (a-b) also. ahore a is minimum of a and b.

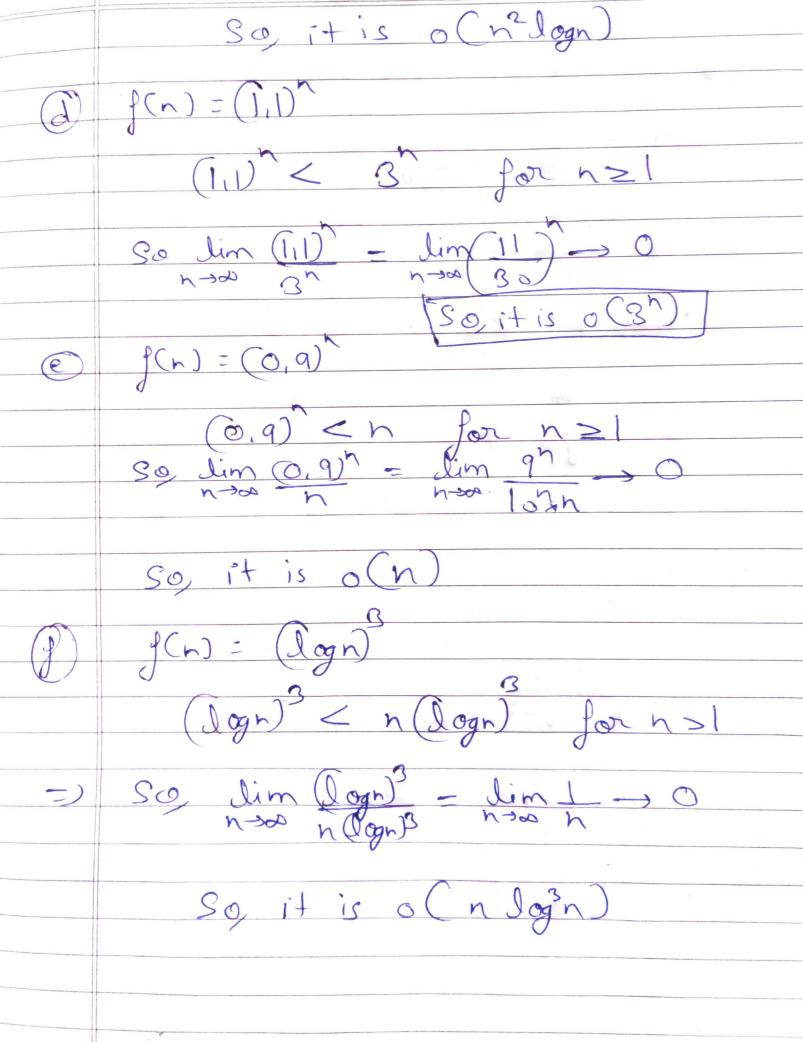
On simplification So, T(n)= n++ + cn+ 30, it is O(n15) (B) T(n)=nT(\(\in\)) T(2)=4 =) $T(n) = \sqrt{n} T(n^{2^2})$ =) $T(n) = n \sqrt{n} T(n^{2^2})$ =) $T(n) = n^{(\frac{1}{2}0^{\frac{1}{2}1})} T(n^{\frac{1}{2}2^2})$ for some k (integor) =) $T(n) = n^{2s+\frac{1}{2}t-\frac{1}{2}k-1}) - (n^{2n})$ let $n^{1/2n} = 2$ =) k = log(logn)None on simplification =) $T(n) = 4 \left[n^{2} - \frac{2}{2n} \right]$ =) 4[n²-lgn) So it is O(n2).



(1)
$$T(n) = A(n_2) + n^3 T(1) = 1$$
 $T(n) = A^2 T(n_2) + A(n_3)^3 + n^3$
 $T(n) = A^2 T(n_2) + A(n_3)^3 + n^3$
 $T(n) = A^2 T(n_2) + n^3 [1 - \frac{1}{2}k]$
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salus In this problem; We could ex r = \frac{1}{2} \f $=) A = \sum_{i=1}^{j-k} 1 = (i+j-k)$ Naw; $\gamma = \frac{1}{2} = \frac{1}{2$ $B = \frac{1+y-k}{2}$ $R = \frac{1+y-k}{2}$ $= \int \left[(i+j)-j \right] + \left[i+j-(j+i) \right] + - + \left[i+j-(j+i) \right]$ =) i + i - 1 + i - 2 + i - i=) i(i+1) - i(i+1) = i(i+1) $=) \quad \gamma = \frac{1}{2} \quad \frac{1}{$ D 1 2 3 + 2 2] $=) \frac{1}{2} \left[\frac{\ln(n+1)}{2} + \ln(n+1) \left(\frac{2n+1}{6} \right) \right]$ $y = \frac{1}{8} \left(\frac{1}{2} \left(\frac{1}{$

So this is the value of & returned by the function xx Z. and evoret case time complexity is O(n4) as the value of of depends on the 4 degree polynomial.