1) 1.1

y =	x = 3,	result
3	9	3

result = 27

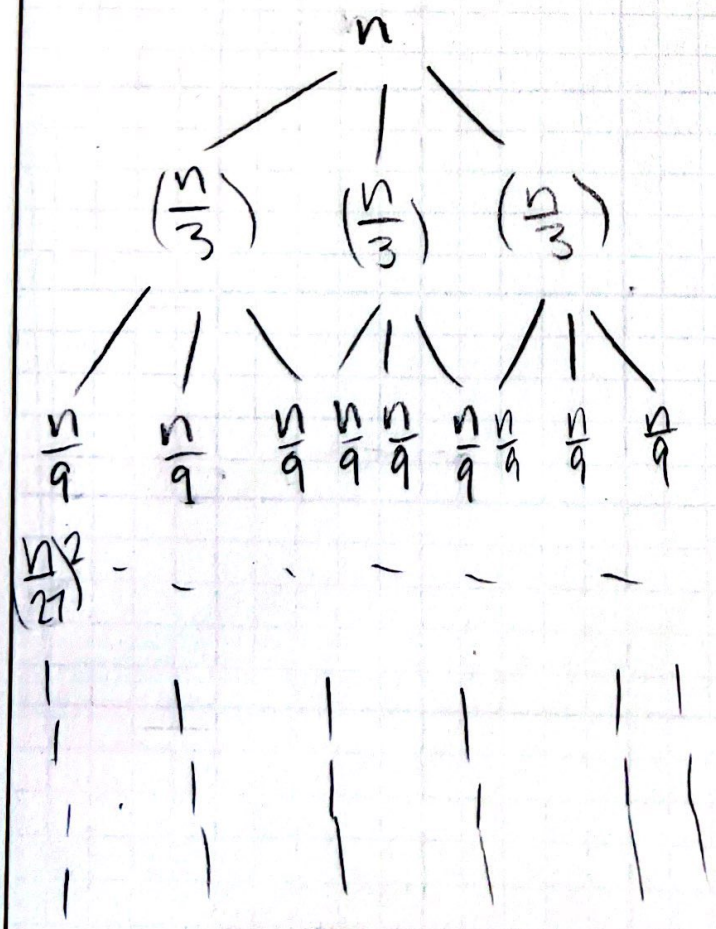
Algorithm output = 27

1.2 It will be executed 1 time

1.3 The algorithm will calculate x^y

2) $T(n) = 2(T(n/3)) + n$

$T(n) = 2T(\frac{n}{3}) + n$



$T(n) = n^2 + \frac{n^2}{3} + \frac{n^2}{9} + \frac{n^2}{27} + \ldots$

log n times

$T(n) = On$

1) Total no. of recursion is 3

2) Input size to each recursive execution is 1

3) $T(n) = n + \frac{n}{3} + \frac{n}{9} + \frac{n}{27} + \cdots$ log n times

4) Total work: $\frac{n}{3}$

2.2 $T(n) = -3$

3) 3.1)

$T(n) = 2T(\frac{n}{2}) + n\log n$

$T(n) = aT(\frac{n}{b}) + f(n)$

$a = 2 \quad b = 2$

$n^{\log_b a} = n^{\log_2 2} = n^1 = n$

Case 2

$\Theta(f(n)\log n) = \underline{\Theta(n\log^2 n)}$

3.2 Master's Theorem can't be applied because $f(n)$ is less than $n^{\log_b a}$ but by a non-polynomial difference.

4)