Problem Set 2

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

Here,

a = 3 subproblems

b = 2, factor

$f(n) = \frac{n}{logn}$

Now, if we calculate $log_b(a)$

$log_2(3) = 1.585...$

If we compare $n^{log_b a} \Rightarrow n^{1.585..}$ with $\frac{n}{logn}$

Here, $n^{1.585}$ is clearly larger than $\frac{n^1}{logn}$

Hence, this is case 1 of the master theorem, since f(n) is $O(n^{log_b a})$

Hence the asymptotic upper bound and lower bound of T(n) is $n^{log(3)}$.