MAT 2345 — Worksheet 5 **Name:** _____

Comparison of Function Growth Rates

1. Order the following functions by their growth rates, from slowest growing to fastest growing:

n $\quad$ $\sqrt{n}$ $\quad$ $n^{\sqrt{n}}$ $\quad$ n^2 $\quad$ $n \log n$ $\quad$ $n \log^2 n$ $\quad$ $n \log(\log n)$

$\frac{2}{n}$ $\quad$ 2^n $\quad$ $2^{\frac{n}{2}}$ $\quad$ 37 $\quad$ $n^2 \log n$ $\quad$ n^3 $\quad$ $n \log n^2$

1	2	3	4	5	6	7	8	9	10	11	12	13	14

2. Determine if the functions f and g are related by the given order notation. Entries in the table should be **YES** or **NO**.

$f(n)$	$g(n)$	$f(n) \in O(g(n))$	$f(n) \in \Omega(g(n))$	$f(n) \in \Theta(g(n))$
$100n + \log n$	$n + \log^2 n$			
$\log n$	$\log n^2$			
$n^2 \log n$	$n \log^2 n$			
$\sqrt{n}$	$\log^5 n$			
$n2^n$	3^n			