Subject: Recitation 13

Year: Month: Date:

1

- $\Theta(n)$, $O(n)$, $\Omega(n)$
- $O(n)$, $o(n)$
- $\Omega(\log^{300} n)$, $\omega(\log^{300} n)$
- $\Omega(n)$, $\omega(n)$
- $o(1.01^n)$, $O(1.01^n)$

2

1. $\lim \frac{2f}{2g} = \lim \frac{f}{g} = 1$ ✓
2. $\lim \frac{f^2}{g^2} = \lim \frac{f}{g} \cdot \frac{f}{g} = \lim \frac{f}{g} \cdot \lim \frac{f}{g} = 1$ ✓
3. $f = n \quad g = 2n$
4. Ref: $\frac{f}{f} = \frac{f}{f}$ ✓

   tran: $\frac{f}{g} = 1$, $\frac{g}{h} = 1 \rightarrow \frac{f}{h} = 1$

   sym: $\frac{f}{g} = 1 = \frac{g}{f}$
5. Ref: $\frac{f}{F} = \frac{f}{F}$ ✓

   tran: $\frac{f}{g} = C$, $\frac{g}{h} = C' \rightarrow g = \frac{f}{C}$, $g = C'h$

   $\rightarrow \frac{f}{C} = C'h \rightarrow \frac{f}{h} = C'C$ ✓

   sym: $\frac{f}{g} = C \rightarrow \frac{g}{f} = \frac{1}{C}$

Subject:

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3-

1. $\lim_{n\to\infty} \frac{a^{b/n}}{1} = \lim a^{b/n} 2^{\log_2(n)\, b/n} = 1$

2. $\lim\left((2\pi n)^{1/2} \left(\frac{n}{e}\right)^n\right)^{1/n}$

$= \lim\left((2\pi n)^{1/2n} \frac{n}{e}\right)$

$= \frac{n}{e} = \theta(n)$