1.4.5 Give tilde approximations for the following quantities:

a) N + 1 is equivalent to $\sim N$

b) 1 + 1/N is equivalent to ~ 1

c) (1 + 1/N)(1 + 2/N) is equivalent to $\sim$ 1 since 1 is dominant after expansion

d) $(2N^3)$ – $(15N^2)$ + N is equivalent to $\sim 2N^3$, since N^3 is dominant

e) $log(2N)/log(N)$

$= \frac{lg(2)+lg(N)}{lg(N)}$

$= \frac{log(2)}{log(N)} + \frac{log(N)}{log(N)}$

$= \sim 1$

f) $\frac{log(N^2+1)}{log(N)}$

$= 2\frac{log(N)}{log(N)}$ *//Used Logarithm power law. Ignore the* 1 *since log is dominant*

$= \sim 2$ g) $\frac{N^100}{2^N}$

$= \sim 0$ since limit approaches 0