R3-10 $(\cancel{\text{if}}\ d(n) = O(f(n))$ and $e(n) = O(g(n))$

then $d(n)e(n) = O(f(n)g(n))$

if $d(n) \le K(f(n))$ $n > O$

and $e(n) \le Rg(n)$ $n > m$

then $d(n)e(n) \le (K\cancel{R})f(n)g(n)$

therefore $\le (K1)f(n)g(n)$ $n > m$

R3-14 $O(\max\{f(n), g(n)\}) = O(f(n)+g(n))$

$d(n) \le K\max(f(n), g(n))$

$d(n) \le K(f(n)+g(n))$

$d(n) \le K(f(n)+g(n))$

R3-17 $(n+1)^5 = O(n^5)$

$n^5+5n^4+10n^3+5n+1 = O(n^5$

$K=1$ $n>1$

$$\frac{f(n)}{g(n)} = \frac{(n+1)^5}{n^5} < \frac{(n+n)^5}{n^5} = \frac{32n^5}{n^5} = 32$$

$n+1 < n+n$ and $(n+n)^5 = 32n^5$

$\therefore$ therefore $(n+1)^5 = O(n^5)$

R3-18 $2^{n+1} = O(2^n)$

$K=1$ $n>1$

$$\frac{f(n)}{f(g)} = \frac{2^{n+1}}{2^n} < \frac{2^{n+2}}{\cancel{2}2^n} = 4$$

$n+1 < n+2$ and $2^{n+2} = (4)2^n$

therefore $2^{n+1}\ \cancel{\ } = O(2^n$