

Do the following problems from your text.

3.1-4

3.1-5

3.2-1

3.2-3

3-3a,b

For part a, compare only $\sqrt{2}^{\lg n}$, n^2 , $(3/2)^n$, 2^{2^n} , 1, $2^{\lg n}$, $4^{\lg n}$, n , 2^n , $n \lg n$

3-4a-d

Additional Exercises

Find the following limits:

$$\lim_{n \rightarrow \infty} \frac{3n \lg^2 n}{2 \lg n(n+3)}$$

$$\lim_{n \rightarrow \infty} \frac{2^{n+1}}{n2^n}$$

$$\lim_{n \rightarrow \infty} \frac{2^{n+1}}{2^n + 3n^3}$$

$$\lim_{n \rightarrow \infty} \frac{3^{n+2}}{2^{2n}}$$

Show whether each of the following is true or false:

$$2^{n+1} = \Omega(2^n)$$

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

$$2^{2n} = O(2^n)$$

$$2^{n/2} = O(2^n)$$

$$\lg 3n = O(\lg 5n)$$

$$2n^3 + 4n = \Theta(n^3 + 2n^2)$$