

- (a) $\lim_{n \rightarrow \infty} \left| \frac{5/(n+1)^3}{5/n^3} \right| = \lim_{n \rightarrow \infty} \frac{n^3}{(n+1)^3} = \lim_{n \rightarrow \infty} \frac{1}{(1+1/n)^3} = 1$. Inconclusive
- (b) $\lim_{n \rightarrow \infty} \left| \frac{(n+1)}{5^{n+1}} \cdot \frac{5^n}{n} \right| = \lim_{n \rightarrow \infty} \frac{n+1}{5n} = \lim_{n \rightarrow \infty} \left(\frac{1}{5} + \frac{1}{5n} \right) = \frac{1}{5}$. Conclusive (convergent)
- (c) $\lim_{n \rightarrow \infty} \left| \frac{(-4)^n}{\sqrt{n+1}} \cdot \frac{\sqrt{n}}{(-4)^{n-1}} \right| = 4 \lim_{n \rightarrow \infty} \sqrt{\frac{n}{n+1}} = 4 \lim_{n \rightarrow \infty} \sqrt{\frac{1}{1+1/n}} = 4$. Conclusive (divergent)
- (d) $\lim_{n \rightarrow \infty} \left| \frac{7\sqrt{n+1}}{1+(n+1)^2} \cdot \frac{1+n^2}{7\sqrt{n}} \right| = \lim_{n \rightarrow \infty} \left[\sqrt{1+\frac{1}{n}} \cdot \frac{1/n^2+1}{1/n^2+(1+1/n)^2} \right] = 1$. Inconclusive