

Problem 10

If $a_0 + a_1 + a_2 + \cdots + a_k = 0$, show that

$$\lim_{n \rightarrow \infty} \left(a_0 \sqrt{n} + a_1 \sqrt{n+1} + a_2 \sqrt{n+2} + \cdots + a_k \sqrt{n+k} \right) = 0$$

If you don't see how to prove this, try the problem-solving strategy of *using analogy* (see page 71). Try the special cases $k = 1$ and $k = 2$ first. If you can see how to prove the assertion for these cases, then you will probably see how to prove it in general.