

Alternating Series Convergence  
Proof Without Words

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**Theorem** *An alternating series*

$$a_1 - a_2 + a_3 - a_4 + a_5 - a_6 + \cdots$$

converges to a sum  $S$  if  $a_1 \geq a_2 \geq a_3 \geq a_4 \geq \cdots \geq 0$  and  $a_n \rightarrow 0$ . Moreover, if  $s_n = a_1 - a_2 + a_3 - \cdots \pm a_n$  is the  $n$ th partial sum then  $s_{2n} < S < s_{2n+1}$  and  $|S - s_n| < a_{n+1}$ .

PROOF

