Non-standard infinite sums

Not for AP Calculus!
(for Srinivasa Ramanujan fans,
Euler fans, Reimann Zeta Function
fans, string theory fans, ...)

Cesàro Convergence

$$A = 1 - 1 + 1 - 1 + 1 - 1 + 1 - \dots$$

$$B = 1 - 2 + 3 - 4 + 5 - 6 + 7 + \dots$$

$$C = 1 + 2 + 3 + 4 + 5 + 6 + 7 + \dots$$

$$\begin{aligned} 2B &= (1 - 2 + 3 - 4 + 5 - 6 + 7 - \dots) \\ &\quad +(\quad 1 - 2 + 3 - 4 + 5 - 6 + \dots) \\ &= (1 - 1 + 1 - 1 + 1 - 1 + 1 - \dots) = A \end{aligned}$$

$$\begin{aligned} C - B &= (1 + 2 + 3 + 4 + 5 + 6 + 7 + \dots) \\ &\quad -(1 - 2 + 3 - 4 + 5 - 6 + 7 - \dots) \\ &= (0 + 4 + 0 + 8 + 0 + 12 + 0 + \dots) = 4C \end{aligned}$$