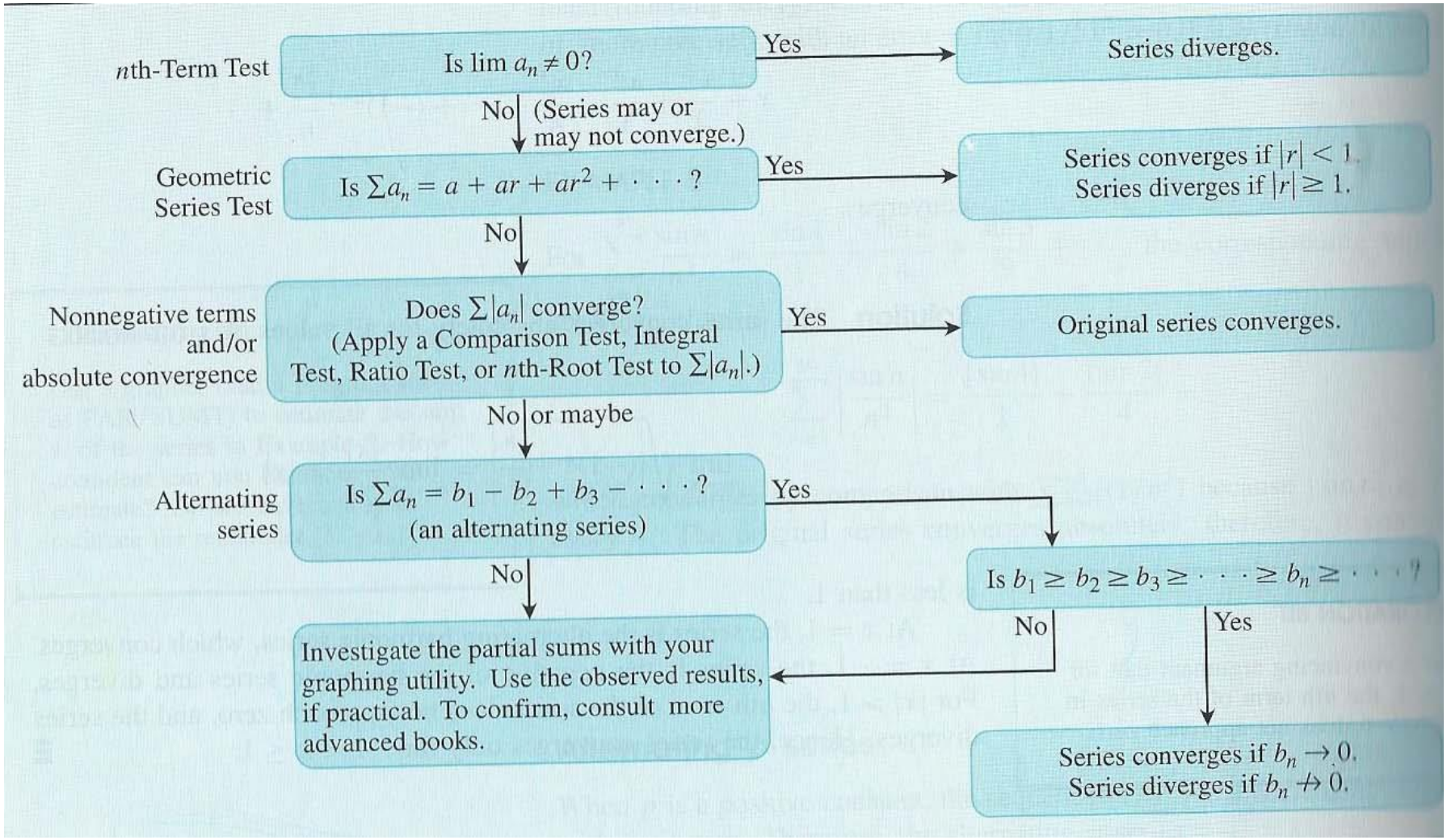
nth-Term Test
Is lim $a_n \neq 0$?
Yes
Series diverges.
No
(Series may or may not converge.)
Geometric Series Test
Is $\sum a_n = a + ar + ar^2 + \cdots$?
Yes
Series converges if $|r| < 1$.
Series diverges if $|r| \geq 1$.
No
Nonnegative terms and/or absolute convergence
Does $\sum |a_n|$ converge?
(Apply a Comparison Test, Integral Test, Ratio Test, or nth-Root Test to $\sum |a_n|$.)
Yes
Original series converges.
No or maybe
Alternating series
Is $\sum a_n = b_1 - b_2 + b_3 - \cdots$?
(an alternating series)
Yes
Is $b_1 \geq b_2 \geq b_3 \geq \cdots \geq b_n \geq \cdots$?
No
Yes
No
Investigate the partial sums with your graphing utility. Use the observed results, if practical. To confirm, consult more advanced books.
Series converges if $b_n \to 0$.
Series diverges if $b_n \not\to 0$.