Problem statement* Suppose $\alpha_n = \dfrac{1}{n^2}$ except when n is a square, and $\alpha_n = \dfrac{1}{n^{3/2}}$ when n is a square. The series whose n^{th} term is α_n is therefore:

$$1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^{3/2}} + \frac{1}{5^2} + \frac{1}{6^2} + \frac{1}{7^2} + \frac{1}{8^2} + \frac{1}{9^{3/2}} + \cdots$$

Does this series converge?

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* This series occurs in a text first published in 1908 by Thomas John l'Anson Bromwich, M.A., Sc.D., F.R.S., "based on courses of lectures given at Queen's College, Galway". A knowledge of history is valuable for scholars in all fields!