n has at most 84 digits. (Hint: it pays to rewrite the inequality as \((10/9)^r \leq 90r\).

This gives \(s \leq 9r \leq (9)(84) = 756; p \leq n < 10^85\).

Now \(p\) being a product of digits must be of the form \(2a3b5c7d\). However from our knowledge of divisibility by 10, \(p\) cannot be divisible by 10 as otherwise 10 would also divide \(n(=sp)\) in which case \(n\) would end in 0 whereby the product of its digits \(p = 0\) which is ruled out. Thus \(p\) can be either of the form \(2a3b7c\) or \(3a5b7c\). This certainly reduced the search space for sum-product numbers and allowed Wilson to verify the needful (for details, see [1]).

Suggested Reading


Errata


**Classroom:**

Root Test and Ratio Test in the Context of \((C, k)\) Summability of Series by P N Natarajan

\(k \geq 0\) should read as \(k > 0\) in the following lines:

- Page 67: line 5 from top;
- Page 68: line 5 from bottom;
- Page 69: line 2 & line 3 from top;
- Page 70: line 8 from top & line 6 from bottom

\(k \geq –1\) should read as \(0 > k \geq –1\) in the following lines:

- Page 69: line 7 from bottom;
- Page 70: line 3 from bottom.