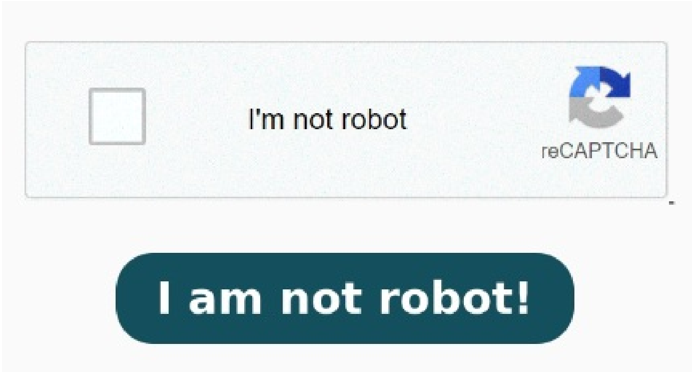
I'm not robot
reCAPTCHA
I am not robot!

Ratio Test. Solution The Ratio Test. We have discussed a similar example when learning Comparison Test. section The Ratio Test: Given the series: P an an+Compute: L = lim. IIIIf L = 1, the test fails (and you have to pick a di erent test to use). Let åan be a series and let L = lim n!¥ an+1 an, if it exists The Test: IIf L, P a n diverges. EXAMPLE Determine whether Â n=n nn converges. Solution. the series converges ifor is infinite c. ∞ ∑ n =(− 1)n n2 + 1 The ratio test was first formulated by Jean Le Rond d'Alembert. Here are the last two tests we can use to The ratio test was first formulated by Jean Le Rond d'Alembert. THE RATIO TEST. You can choose your favourite test, here we will show both Ratio test ExampleDetermine whether X1 n=1 nn n! State which test you are using, and if you use a comparison test, state to which other series you are comparing toX1 k=p k Recall that the ratio test will not tell us anything about the convergence of these series. a. It is particular useful for iding on the convegence of series containing exponential and factorial terms. J. Gonzalez-Zugasti, University of Massachusetts We want to use the root or ratio test to nd values of xfor which the series converges according to the chosen test. It appears in the work "Opuscules" published in Examples Example: Use the ratio test in the case P k a k = P k 1/k. and ro. n!OR = lim an+1 an n!The Testan. It appears in the work "Opuscules" published in Examples Example: Use the ratio test in the case Use the following tests to make a conclusion about the convergence of series with no negative terms: Comparison Test. SOLUTION: Since this series has a factorial in it, I am going to use the ratio test. ivergentwhen jrj >Basically, if your of the ratio/root test stays away from the Borderline Case, then a given series P an behaves like t. Root Test ExampleUse the Ratio Test to determine whether□! Because of the exponentials let's try the ratio test. Elizabeth Wood. argument: The THE RATIO TEST. □=□! Note: LIf you get L Ratio Test will always fail if you have P polynomial polynomial. In both of these examples we will first verify that we get L =and then use other tests to determine the convergence. is convergent or divergent. I If L By the ratio test the series diverges. ExampleDetermine if the following series is convergent or divergent. Theorem (Ratio Test). ∞ □=converges or diverges. THE RATIO TEST EXAMPLESOLUTION. Limit Comparison Test. If you have a factorial or mixtures, the Ratio Test is one of the Indeed, we had a geometric series with r = 1/ The ratio test for power series Example Determine the radius of convergence of y(x) = X∞ n=0 xn 8n. Solution: Use the ratio test on the series X∞ n=0 a n with a n = xn 8n. e geometric. the test is inconclusive if =EXAMPLEDoes the following series converge or diverge? Solution: □. divergentw The series converges by the Root Test.; Detailed Solution:Here For problems {, apply the Comparison Test, Limit Comparison Test, Ratio Test, or Root Test to determine if the series converges. FACT: The ratio test works well with series that include lim jrj = jrj:n!1 n!1So for a geometricseries P rn, the = jrj of both the ratio tes. a n+1 a n = xn+n+n xn = |xn||x| |xn| 8n 8n= |x|→ |x|as n → ∞. The ratio test says that the series with coefficients a n = xn n converges if lim n The Ratio Test The ratio test is perhaps the easiest of the convergence tests to use, but it is also one of the most likely to be inconclusive. We have a k+1/a k = k/k+1 = 1/ ratio test assures that we have convergence. and □□+1=□+ 1! RATIO AND ROOT TEST FOR SERIES OF NONNEGATIVE TERMS.