

COMPARISON OF THE RIEMANN AND LEBESGUE INTEGRAL

by
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk “Comparison of the Riemann Integral and Lebesgue Integral” by Chow Lee Kum, No. Matriks: UK 14462 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Matematik sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains Matematik Komputasi, Fakulti Sains dan Teknologi, UMT.

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DECLARATION

I hereby declare that this final year project entitled “Comparison of the Riemann Integral and Lebesgue Integral” is the result of my own research except as cited in the references.

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ABSTRACT

The development of the integral in most introductory analysis courses is centered almost exclusively on the Riemann integral. In this historical development the integration is simply introduced as finding the area under a curve. The Riemann integration is a basic concept in mathematical analysis, since it is related to boundedness, continuity and differentiability. We also consider some integrals of Stieltjes type which are considered as generalizations of the Riemann integrals which involve two bounded functions. The Stieltjes integral has very useful applications in probability theory, mechanics as well as theoretical physics. Another theory of integration more general than the Riemann theory was called Lebesgue integral, it considers the concept of measure of a set, starting with simple functions and ending with measurable functions, this approach leads to greater generality in the types of functions that can be integrated. We will compare both of these integrations by using their theorems.

PERBANDINGAN ANTARA PENGAMIRAN RIEMANN DAN PENGAMIRAN LEBESGUE

ABSTRAK

Dalam bidang analisis, kamiran Riemann adalah pendahuluan yang paling istimewa dalam perkembangan pengamiran. Dalam perkembangan lepas, pengamiran hanya semata-matanya untuk memperkenalkan mencari luas dibawah satu lengkung. Kamiran Riemann adalah konsep asas dalam analisis matematik, ia dikaitkan dengan keterbatasan, keselanjaran, dan kebolehbezaan. Kita juga menimbangkan sesetengah kamiran iaitu model Stieltjes di mana menganggap sebagai generalisasi daripada kamiran Riemann dimana ia melibatkan dua fungsi batas. Stieltjes sangat berguna dalam aplikasi dalam teori kebarangkalian, mekanik seperti berdasarkan teori fizik. Theori pengamiran yang seterusnya adalah lebih umum daripada kamiran Riemann adalah dinamakan sebagai kamiran Lebesgue, ia dipertimbangkan sebagai konsep pengukuran suatu set, dimulakan dengan fungsi mudah dan measurable fungsi sebagai pengakhiran, pencapaian ini memimpin kamiran yang lebih baik untuk pelbagai fungsi. Kita akan membandingkan kedua-dua pengamiran tersebut dengan menguankan prinsip yang telah dibuktikan secara logik.