Vietnam National University of Agriculture
Department of Mathematics

April 24, 2017

Course name: Calculus 2, Sch.Y 06-07

Midterm Exam No.1
Duration 50 minutes

Unauthorized materials

Exercise 1.

a) [1.5 pt] Express the following limit as a definite integral

$$\lim_{\|P\|\to 0}\sum_{k=1}^{n}\frac{c_k+1}{c_k}\triangle x_k,$$

where $P=[x_1,\cdots,x_n]$ is a partition of the interval $[1,2]$; $c_k\in[x_{k-1},x_k]$, and $\triangle x_k=x_k-x_{k-1}$. Then evaluate the definite integral to give the limit.

b) [1.5 pt] Give a partition of the interval $[0,1]$, then express the integral $\int_0^1(x^2+1)dx$ as a limit of Riemann sums. (Do not evaluate the limit)

Exercice 2. Find the derivative of the function

a) [1.0 pt] $y=\int_1^x(1+u^4)du$.

b) [1.0 pt] $y=\int_2^{x^2}e^t dt$.

Exercice 3. Evaluate the following integrals

a) [1.0 pt] $\int_0^1(2x+1)\sqrt{x+1}dx$.

b) [1.0 pt] $\int x\ln(x+1)dx$.

c) [0.5 pt] $\int_1^\infty\frac{1}{x^{\frac{3}{2}}}dx$ (if it exists).

Exercice 4. A particle moves along the $x-$axis with velocity

$$v(t)=-(t-3)^2+5,\ \text{for } 0\le t\le 6.$$

a) [1.5 pt] Find the average velocity of this particle during the time interval $[0,6]$.

b) [1.0 pt] Find a time t_0 such that the velocity at this time is equal to the average velocity of this particle during the time interval $[0,6]$.

Edited by Quang Sang Phan

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Department of Mathematics

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Course name: Calculus 2, Sch.Y 06-07

Midterm Exam No. 2
Duration 50 minutes

Unauthorized materials

Exercise 1.

a) [1.5 pt] Express the following limit as a definite integral

$$\lim_{\|P\|\to 0}\sum_{k=1}^{n}\frac{2c_k^2+1}{c_k}\triangle x_k,$$

where $P=[x_1,\cdots,x_n]$ is a partition of the interval $[1,2]$; $c_k\in[x_{k-1},x_k]$, and $\triangle x_k=x_k-x_{k-1}$. Then evaluate the definite integral to give the limit.

b) [1.5 pt] Give a partition of the interval $[0,1]$, then express the integral $\int_0^1(1-x^2)dx$ as a limit of Riemann sums. (Do not evaluate the limit)

Exercice 2. Find the derivative of the function

a) [1.0 pt] $y=\int_1^x(2t^3+1)dt$.

b) [1.0 pt] $y=\int_2^{x^2}\sin u\ du$.

Exercice 3. Evaluate the following integrals

a) [1.0 pt] $\int_1^2(x+1)\sqrt{x-1}dx$.

b) [1.0 pt] $\int x\ln(x-1)dx$.

c) [0.5 pt] $\int_1^\infty\frac{1}{x^{\frac{1}{2}}}dx$ (if it exists).

Exercice 4. A particle moves along the $x-$axis with velocity

$$v(t)=-(t-2)^2+6,\ \text{for } 0\le t\le 4.$$

a) [1.5 pt] Find the average velocity of this particle during the time interval $[0,4]$.

b) [1.0 pt] Find a time t_0 such that the velocity at this time is equal to the average velocity of this particle during the time interval $[0,4]$.

Edited by Quang Sang Phan