

MATH 132 CALCULUS II MIDTERM EXAM
24 March 2018 10:00 -11:45

Student Name: _____

Instructors: *Dr. Refail Abizade, Dr. Şule Ayar, Dr. Ahmet Yantir, Dr. Esra Dalan*

Question#	1	2	3	4	Total
Question Value	25	25	20	30	100
Your Grade					

[25pt] 1. Evaluate the following integrals:

(a) $\int \frac{\ln x}{(x-3)^2} dx$

(b) $\int \frac{\cos x}{\sqrt{2 - \cos^2 x}} dx$

[25pt] 2. (a) Use a proper substitution and method of partial fraction to evaluate the integral

$$\int \frac{dx}{2\sqrt{x}(\sqrt{x}-1)(x+1)}$$

(b) Determine whether the improper integral

$$\int_1^{\infty} \frac{1 - \sin^2 x}{x^2 + 3} dx$$

converges or diverges.

[20pt] 3. (a) Find the sum of the series

$$\sum_{n=0}^{\infty} \frac{3 + 2^n}{3^{n+2}}$$

(b) Use the limit comparison test to determine

$$\sum_{n=2}^{\infty} \frac{n + \ln n}{n^2 + 2n - 1}$$

converges or diverges.

[30pt] 4. (a) Use the Integral Test to determine if the series converges or diverges:

$$\sum_{n=1}^{\infty} \frac{\ln n}{n\sqrt{1 + \ln^2 n}}$$

(b) Is the series $\sum_{n=1}^{\infty} a_n$ defined by the formulas $a_1 = 1$; $a_{n+1} = \left(\frac{n-1}{n}\right)^n a_n$ convergent or divergent.

(c) Determine if the series converges or diverges: $\sum_{n=1}^{\infty} (\sqrt{n^2 + n} - n)^n$

GOOD LUCK!

MATH 132 CALCULUS II MIDTERM EXAM
25 March 2017 10:30-12:20

Student Name: _____

Instructors: *Dr. Refail Alizade, Dr. Sahlar Meherrem, Dr. Ahmet Yantir, Dr. Esra Dalan*

Question#	1	2	3	4	Total
Question Value	25	25	25	25	100
Your Grade					

[25pt] 1. Evaluate the following integrals:

(a) $\int \sin^3 x \cos^4 x dx$

(b) $\int \frac{\sec^2 t dt}{\tan^2 t + 3 \tan t - 10}$

[25pt] 2. (a) Use proper trigonometric substitution to evaluate the integral $\int \frac{x^3 dx}{\sqrt{x^2 + 9}}$.

(b) Use the direct comparison test to determine whether the improper integral

$$\int_1^{\infty} \frac{x \cos^2 x}{x^{(6/2)} + 3} dx$$

converges or diverges.

[25pt] 3. (a) Find the sum of the series

$$\sum_{n=0}^{\infty} \frac{3 \cdot 4^n + 6^{n+1}}{10^{n+1}}$$

(b) Use the integral test to determine if the series

$$\sum_{n=1}^{\infty} n e^{-n}$$

converges or diverges.

[25pt] 4. (a) Use the root test to determine if the series

$$\sum_{n=1}^{\infty} \frac{(n!)^n}{n^{(n^4)}}$$

converges or diverges.

(b) Use the limit comparison test to determine if the series

$$\sum_{n=1}^{\infty} \frac{n}{n^3 + 4}$$

converge or diverge.

GOOD LUCK!

MATH 112 CALCULUS II Midterm Exam
 April, 9 2016 10:30 -12:20

Student Name: _____

Instructors: Prof. Dr. Refail Alizade, Assoc. Prof. Dr. Sahlar Meherrem,
 Asst. Prof. Dr. Ahmet Yantir, Asst. Prof. Dr. Esra Dalan, Asst. Prof. Dr. Sule Ayar
 Assistants: Asli Guler Serinken, Zeynep Ors Yoryancioglu, Saadet Eskizmirtiler

Question#	1	2	3	4	Bonus	Total
Question Value	25	25	15	25	10	110
Your Grade						

[25pt] 1. Evaluate the following integrals:

(a) $\int \frac{2 + 3x + x^2}{x(x^2 + 1)} dx$

(b) $\int \sin^3 x \cos^8 x dx$

[25pt] 2. Evaluate the following integrals:

(a) $\int \cos \sqrt{x} dx$

(b) $\int \frac{x^2}{(x^2 - 1)^{5/2}} dx \quad (x > 1)$

[25pt] 3. (a) Evaluate the value of the improper integral $\int_{\frac{1}{\sqrt{3}}}^{\infty} \frac{dx}{(1 + x^2)^{3/2}}$

(b) Determine whether the improper integral

$$\int_2^{\infty} \frac{\sqrt{x-1} \sin^2 x}{x^2} dx$$

converges or diverges.

[25pt] 4. (a) Find the sum of the series

$$\sum_{n=6}^{\infty} (-1)^n \frac{2^{n+3}}{3^n}$$

(b) Determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \ln\left[\frac{n}{2n+1}\right]$$

BONUS (10 pt) $\int_0^a f(x) dx = \int_0^a f(a-x) dx$ is given. Use this fact evaluate

$$\int_0^{\pi/2} \frac{\sin x}{\sin x + \cos x} dx$$

GOOD LUCK!

YASAR UNIVERSITY
Department of Mathematics

Calculus II		Midterm Exam	
Code : <i>Math 112</i>	Last Name :	Student No : Section :	
Acad. Year : <i>2013-2014</i>	Name :		
Semester : <i>Spring</i>	Department :	4 Questions on 1 Page. Values are indicated below.	
Instructor : <i>Ahmet Yantir</i>	Signature :		
Date : <i>Apr. 11, 2014</i>			
Time : <i>15:00</i>			
Duration : <i>90 minutes</i>			
1	2	3	4

Question 1. (a) (10 pts) Use method of partial fractions to write the integral

$$\int \frac{2x + 1}{(x - 1)^2(x^3 + x)^2} dx$$

in simpler form. DO NOT EVALUATE THE CONSTANTS!

(b) (10 pts) $\int \frac{e^x dx}{e^{2x} + 3e^x + 2} = ?$

Question 2. (30 pts) Evaluate the following integrals:

(a) $\int \arcsin x dx$. *Hint:* Integration by parts. (b) $\int \sin^5 x \cdot \cos^2 x dx = ?$

(c) $\int \frac{x dx}{1 + x^4} = ?$ *Hint:* Use a proper substitution and then a trigonometric substitution.

Question 3. (a) (10 pts) Determine whether the improper integral $\int_2^{\infty} \frac{2dx}{x^{3/2} - 1}$ converges or diverges?

(b) (10 pts) $\lim_{n \rightarrow \infty} \left(\frac{3}{n}\right)^{1/n} = ?$

(c) (10 pts) Does the series $\sum_{n=0}^{\infty} \frac{e^n}{e^n + n}$ converge or diverge?

Question 4. (25 pts) Determine whether the following series converge or diverge.

(a) $\sum_{n=1}^{\infty} \frac{n(n+1)}{(n^2+1)(n-1)}$

(b) $\sum_{n=1}^{\infty} \frac{1}{n(1 + \ln^2 n)}$

GOOD LUCK!

YASAR UNIVERSITY
Department of Mathematics

Calculus II					
Midterm Exam					
Code	: <i>Math 112</i>		Last Name	:	
Acad. Year	: <i>2012-2013</i>		Name	:	Student No
Semester	: <i>Fall</i>		Department	:	Section
Instructor	: <i>Ahmet Yantir</i>		Signature	:	
Date	: <i>Nov. 20, 2012</i>		6 Questions on 1 Page.		
Time	: <i>11:00</i>		Values are indicated below.		
Duration	: <i>90 minutes</i>				
1	2	3	4	5	Bonus

Question 1. (10 pts) Find the volume of the solid, generated by revolving the region bounded by the curves $y = 4 - x^2$ and $y = 2 - x$ around x -axis.

Question 2. (a) (10 pts) Use method of partial fractions to write the integral

$$\int \frac{x-5}{(x^2-4)^2(x^2+1)^2} dx$$

in simpler form. DO NOT EVALUATE THE CONSTANTS!

(b) (10 pts) $\int \frac{\cos x dx}{\sin^2 x + \sin x - 6} = ?$

Question 3. (30 pts) Evaluate the following integrals:

(a) $\int \frac{\ln x}{x(1+\ln x)} dx.$

(b) $\int \frac{x dx}{25+x^2} = ?$

(c) $\int \sin^3 x \cdot \cos^4 x dx = ?$

Question 4. (a) (10 pts) Test the following improper integral for convergence:

$$\int_2^{\infty} \frac{x^2+5}{x^{7/2}-1} dx.$$

(b) (10 pts) Find the value sum of the geometric series

$$\sum_{n=0}^{\infty} \left(\frac{2^{n+1}}{5^n}\right).$$

Question 5. (20 pts) Determine whether the following series converge or diverge.

(a) $\sum_{n=1}^{\infty} \frac{n^n}{2^{n^2}}$

(b) $\sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^n$

BONUS. (10 pts) Find the length of the curve $y = \int_{-2}^x \sqrt{5t^4 - 1} dt$ from $x = 1$ to $x = 3$.

Hint Leibnitz Formula

GOOD LUCK!

YASAR UNIVERSITY
Department of Mathematics

Calculus II Midterm Exam					
Code	: <i>Math 112</i>		Last Name :		
Acad. Year	: <i>2010-2011</i>		Name :	Student No :	
Semester	: <i>Spring</i>		Department:	Section :	
Instructor	: <i>Ahmet Yantir</i>		Signature :		
Date	: <i>Apr. 06, 2012</i>		6 Questions on 1 Page. Each 20 pts.		
Time	: <i>09:00</i>				
Duration	: <i>90 minutes</i>				
1	2	3	4	5	Bonus

Question 1. Find the volume of the solid, generated by revolving the region bounded by the curves $y = 2\sqrt{x}$, $y = 2$ and $x = 0$ around y - axis.

Question 2. a) Use method of partial fractions to write the integral

$$\int \frac{x+3}{(x^2-1)^2(x^2+4)^2} dx$$

in simpler form. DO NOT EVALUATE THE CONSTANTS!

b) $\int \frac{dx}{e^{2x} - 4e^x + 4} = ?$

Question 3. a) Use the substitution $x = u^2$ and then a proper technique to evaluate the integral

$$\int \sqrt{\frac{9-x}{x}} dx.$$

b) $\int x^5 \sin x^3 dx = ?$

Hint: Apply a proper substitution and integration by parts.

Question 4. a) $\int \sin^3 x \cdot \cos^5 x dx = ?$

b) $\int_{\pi/4}^{\pi/2} \sqrt{1 + \cos 4x} dx = ?$

Question 5. a) Find the value of the improper integral

$$\int_e^{\infty} \frac{dx}{x(\ln x)^2}.$$

b) (10 pts) Test the following improper integral for convergence:

$$\int_0^{\infty} \frac{x^2}{x^5 + 1} dx.$$

BOUNUS. (5 pts) Find the length of the curve $y = \int_{-2}^x \sqrt{5t^4 - 1} dt$ from $x = 1$ to $x = 3$.

Hint: Leibnitz Formula

GOOD LUCK!

YASAR UNIVERSITY
Department of Mathematics

Calculus II Midterm Exam					
Code	: <i>Math 112</i>	Last Name :			
Acad. Year	: <i>2010-2011</i>	Name :	Student No :		
Semester	: <i>Spring</i>	Department :	Section :		
Instructor	: <i>Ahmet Yantir</i>	Signature :			
Date	: <i>Apr. 06, 2011</i>	6 Questions on 1 Page.			
Time	: <i>15:30</i>	The values of the questions are indicated below.			
Duration	: <i>100 minutes</i>				
1	2	3	4	5	Bonus

Question 1. (20 pts) Find the volume of the solid, generated by revolving the region bounded by the curves $y = 4 - x^2$ and $y = 2 - x$ around x -axis.

Question 2. a) (10 pts) Use method of partial fractions to write the integral

$$\int \frac{x-5}{(x^2+x-6)^2(x^2+1)^2} dx$$

in simpler form. **DO NOT EVALUATE THE CONSTANTS!**

b) (10 pts) $\int \frac{e^{4t} + 2e^{2t} - e^t}{e^{2t} + 1} dt = ?$

Question 3. a) (10 pts) Use the substitution $x = u^2$ and then a proper technique to evaluate the integral

$$\int \sqrt{\frac{4-x}{x}} dx.$$

b) (10 pts) $\int x^5 e^{x^3} dx = ?$

Question 4. a) (10 pts) Use the substitution $t = \tan \frac{x}{2}$ to evaluate $\int \frac{dx}{\sin x - \cos x}$

b) (10 pts) Test the following improper integral for convergence:

$$\int_{\pi}^{\infty} \frac{2 + \cos x}{x} dx$$

Question 5. (20 pts) The sequence $a_n = \frac{n}{2^n}$ is given.

- Is a_n increasing or decreasing?
- Is a_n bounded? If yes find the upper and lower bounds.
- $\lim_{n \rightarrow \infty} a_n = ?$

BONUS. (5 pts) Find the length of the curve $y = \int_{-2}^x \sqrt{3t^4 - 1} dt$ from $x = -2$ to $x = -1$

GOOD LUCK!

YASAR UNIVERSITY
Department of Mathematics

Calculus II		Midterm Make-up Exam	
Code : <i>Math 112</i>	Last Name :		
Acad. Year : <i>2011-2012</i>	Name :		
Semester : <i>Spring</i>	Department :	Section :	
Instructor : <i>Ahmet Yuntir</i>	Signature :	4 Questions on 1 Page. Each 25 points.	
Date : <i>Apr. 19, 2012</i>			
Time : <i>13:30</i>			
Duration : <i>90 minutes</i>			
1	2	3	4

Question 1. Find the volume of the solid, generated by revolving the region in the first quadrant bounded on the left by the circle $x^2 + y^2 = 3$, on the right by $x = \sqrt{3}$ and above by the line $y = \sqrt{3}$ around y -axis.

Question 2. (a) Use method of partial fractions to write the integral

$$\int \frac{x-5}{(x^3-x)^2(x^2+3)^2} dx$$

in simpler form. DO NOT EVALUATE THE CONSTANTS!

b) $\int \frac{\cos t dt}{\sin^2 t + \sin t - 6} dt = ?$

Question 3. (a) Use the substitution $x = u^2$ and then a proper technique to evaluate the integral

$$\int e^{\sqrt{3x+9}} dx.$$

b) $\int e^{-x} \cos x dx = ?$

Question 4. (a) Evaluate the improper integral $\int_0^{\infty} \frac{16 \arctan x}{1+x^2} dx.$

b) Test the following improper integral for convergence: (Hint: $t \geq \sin t$, for $t \geq 0$.)

$$\int_0^1 \frac{dx}{x - \sin x}$$

GOOD LUCK!

MATH 1132 CALCULUS II MIDTERM EXAM
March 23, 2019 14:30-16:20

Student Name: _____

Instructors: *Dr. Refail Alizade, Dr. Şule Ayar, Dr. Ahmet Yantir, Dr. Esra Dalan*

Question#	1	2	3	4	Total
Question Value	30	20	20	30	100
Your Grade					

[30pt] 1. Evaluate the following integrals:

(a) $\int \frac{e^{4t} + 2e^{2t} - e^t}{e^{2t} + 1} dt$

(b) $\int 8 \cos^3 2x \sin 2x dx$

(c) $\int \frac{dx}{x\sqrt{1 + (\ln x)^2}}$

[20pt] 2. (a) Evaluate the following improper integral $\int_0^1 3x^2 \ln x dx$.

(b) Determine whether the improper integral

$$\int_4^\infty \sqrt{\frac{x^2}{x^4 - 1}} dx$$

converges or diverges.

[20pt] 3. (a) Find the sum of the series $\sum_{n=1}^\infty \frac{2}{n^2 + 4n + 3}$.

(b) True or false? Explain your answer.

(i) () $\sum_{n=1}^\infty \frac{n!}{(n+1)!}$ converges by n th term test.

(ii) () $\sum_{n=1}^\infty \frac{n \arctan n}{(n+1)}$ diverges by n th term test.

[30pt] 4. (a) Use the Integral Test to determine if the series converges or diverges:

$$\sum_{n=1}^\infty \frac{1}{(\arctan n)^2(1 + n^2)}$$

(b) Determine if the series converges or diverges: $\sum_{n=1}^\infty \frac{2^n n!}{1 \cdot 4 \cdot 7 \cdots (3n + 1)}$.

(c) Determine if the series converges or diverges: $\sum_{n=1}^\infty \frac{2^n + n^2}{3^n + \ln n}$.

GOOD LUCK!