

Course No: ENG 1306, ENGI 1302
Course Title: Calculus II
Date: 11/1/2018
No. of Questions: (5)
Time: 2.00 hour
Using Calculator (yes)

University of Palestine



Final Exam
2017/2018
Total Grade:50

Instructor Name: Eng. Albaz
Student No.: _____
Student Name: _____
College Name: _____
Dep. / Specialist: _____
Using Dictionary (No)

Question One: **10 points**

A) Solve for x:

1) $\ln(2-x) + \ln(x) = 0$

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2) $\tan(x) = \ln(\sin^2 x + \cos^2 x) + 1$

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B) If $f(x) = x^2 + 1$

1) Find the interval at which $f(x)$ has inverse.

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2) Find the inverse of $f(x)$ at that interval.

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3) Find $\left. \frac{df^{-1}}{dx} \right|_{x=5}$

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Question Two:

10 points

A) Solve the following limits

1) $\lim_{x \rightarrow \infty} \left(1 + \frac{5}{x}\right)^x$

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2) $\lim_{x \rightarrow \infty} \frac{1}{x^2 - 1} - \frac{1}{\ln(x)}$

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3) $\lim_{x \rightarrow 0} x \ln\left(\frac{1}{x}\right)$

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B) Test the growth of $f(x) = x^2 + 2x$ and $g(x) = (x + 7)2x$ as $x \rightarrow \infty$?

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C) Show that $\lim_{x \rightarrow 0} \frac{\sin(x)}{x} = 1$

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Question Three : **10 points**

A) Find the derivative of the following:

1) $y = (\sinh(x))^{\ln(5)} + (2 \sin^2 x + 2 \cos^2 x)^{\cos x}$

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2) $y = \cos^{-1}(\cos(x^2 + 2))$

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3) $\cos^{-1} y + \ln(y - 1) + x^2 = \sin^{-1} x + e^{xy}$

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B) Find the tangent line to $\ln(y) = x^2 + 2$ at $x=1$?

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Question Four : **10 points**

A) Evaluate the following integrals.

1) $\int \sin(x) e^{-x} dx$

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2) $\int \frac{dx}{\sqrt{9x^2 - 16}}$

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

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

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5) $\int \frac{1}{\sqrt{2x - x^2}} \frac{1}{\cos^{-1}(x - 1)} dx$

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Question Five : **10 points**

A) Test for convergence:

1) $\int_{-\infty}^{\infty} \frac{\tan^{-1} x}{1+x^2} dx$

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2) $\int_1^{\infty} \frac{\sin^2 x}{x^2} dx$

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3) $\int_1^{\infty} \frac{x^5}{\sqrt{1+x^7}} dx$

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