CONCORDIA

Exam MATH 203 G 2204

You can preview this exam, but if this were a real attempt, you would be blocked because:

Start attempt

This exam is not currently available

Questions attempted: 0/10

Information

Time:

75 min + 10 min added for **visual registration** of pages. (You will have 30 minutes for uploading the pages that you have registered after finishing your attempt).

Unsure

$x^2-4x-6=0$

1 of 10 Marks

Solve for x : $8^2\,4^{2x} = 2^{x^2}$.

$2^6 \cdot 2^{4x} = 2^{x^2} \Rightarrow 2^{6+4x} = 2^{x^2}$ $\quad x_{1,2} = 2\pm\sqrt{4+6} = 2\pm\sqrt{10}$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Unsure Notes

$D_f = R_{f^{-1}} : (-\infty, +\infty)$ $\quad y = \log_3(9+3^x) \Leftrightarrow 9+3^x = 3^y$

$3^x = 3^y - 9 \Rightarrow x = \log_3(3^y-9) = f^{-1}(y)$

2 of 10 Marks

$R_f = D_{f^{-1}} : (2, +\infty)$

Find the inverse $f^{-1}(x)$ of the function $f(x) = \log_3(9-3^x)$.

Determine the domain and the range of $f(x)$ and of $f^{-1}(x)$.

$f^{-1}(x) = \log_3(3^x-9) \Rightarrow x > 2$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Unsure Notes

3 of 10 Marks

Find all **(a)** horizontal and **(b)** vertical asymptotes of the graph of

VAs: $x=0,\ x=-2$

$$\frac{(x-2)\sqrt{4+16x^2+9x^6}}{(x^2+2x)(x^2-4)} = \frac{\sqrt{4+16x^2+9x^6}}{x(x+2)^2} \to \pm 3 \text{ at } \pm\infty$$

HAs: $y=3$ at $+\infty$

$y=-3$ at $-\infty$.

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Unsure Notes

CONCORDIA

Exam MATH 203 G 2204

You can preview this exam, but if this were a real attempt, you would be blocked because:

Start attempt

This exam is not currently available

Questions attempted: 0/10

4 of 10 Marks

Find the limit. If the limit does not exist explain why.

$$\lim_{t\to 0}\left(\frac{1}{t\sqrt{1+2t^2}}-\frac{1}{t}\right)$$

$= \lim_{t\to 0} \frac{1-\sqrt{1+2t^2}}{t\sqrt{1+2t^2}} = \lim_{t\to 0} \frac{-2t^2}{t\sqrt{1+2t^2}(1+\sqrt{1+2t^2})} = 0$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Notes

Unsure

5 of 10 Marks

(4+3 marks) Consider the piecewise function $f(x)$ with parameters a and b:

$$f(x)=\begin{cases} ax+2b & \text{if } x\le 0 \\ x^2+3ax-b & \text{if } 0<x\le 1 \\ 3x-5 & \text{if } x>1 \end{cases}$$

$2b=-b \Rightarrow \boxed{b=0}$

$1+3a=-2 \Rightarrow \boxed{a=-1}$

A. Find the values of a and b that make $f(x)$ continuous everywhere.

B. In that case, will the function $f(x)$ also be differentiable at $x=0$? Explain why yes or why not.

$f(x)=\begin{cases} -x, & x\le 0 \\ x^2-3x, & 0<x\le 1 \\ 3x-5, & x>1 \end{cases}$

$(-x)'=-1$

$(x^2-3x)'=2x-3$, $\left.2x-3\right|_{x=0}=-3$

not differentiable at $x=0$.

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Notes

Unsure

6 of 10 Marks

Find the derivative of the function:

(you have to show **at least one intermediate step** of your calculations)

$$f(x)=\frac{x^3+\tan(2x)}{\tan(2x)+x^3}\cdot e^2 x^{1/2} = 1+e^2\sqrt{x}$$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

$f' = \frac{e^2}{2\sqrt{x}}$

I have answered this question.

Notes

Unsure

CONCORDIA

Exam MATH 203 G 2204

You can preview this exam, but if this were a real attempt, you would be blocked because:

Start attempt

This exam is not currently available

Questions attempted: 0/10

7 of 10

Marks

Find the derivative of the function:

(you have to show **at least one intermediate step** of your calculations)

$$f(x) = \sin(x\,e^{2x}) + \cos(x + e^{2x})$$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

$f' = \cos(xe^{2x} + \cos(x+e^{2x})) \cdot [e^{2x} + 2xe^{2x} - \sin(x+e^{2x}) \cdot [1 + 2e^{2x}]]$

Unsure

Notes

8 of 10

Marks

Find the second derivative $f''(x)$ of the function

$$f(x) = x^2\,e^{bx}(x^2 + e^{bx}) = e^{bx+x^2}$$

where b is a parameter (a real number), and calculate its **exact** value $f''(0)$ at $x = 0$.

(HINT: simplify the function before calculating $f''(x)$)

$f' = b^2 e^{bx} + 2$, $f''(0) = b^2 + 2$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

Unsure

Notes

9 of 10

Marks

(4+3 marks) Given the function $f(x) = \sqrt{2x+5}$,

a. Calculate $f'(x)$ using its definition as a limit of difference quotient.

b. Write the equation of the tangent line to $y = f(x)$ at the point $(2, 3)$.

$$f' = \lim_{h\to 0} \frac{\sqrt{2x+2h+5} - \sqrt{2x+5}}{h} = \lim_{h\to 0} \frac{2h}{h(\sqrt{2x+2h+5} + \sqrt{2x+5})} = \frac{1}{\sqrt{2x+5}}$$

Please answer this question on paper. You will upload your photos after having finished and submitted the online part of the exam.

I have answered this question.

$f'(2) = \frac{1}{3} \Rightarrow y_t = 3 + \frac{1}{3}(x-2) = \frac{x}{3} + \frac{7}{3}$.

Unsure

Notes