#1 1 of 4



Math 180	Name (Print):	
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#1 2 of 4

Math 180 Sample Exam

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Page 2 of 3

1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

e (cest)2

y1=-simx

2+et2 | Cosx 2+et2 | 2 2eox e coo2x -4e4 -shx e coo2x -e4

#1 3 of 4



Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

integal Sest

Alklis con Muons

foxl is positive

fzL

hidilo-lodihi
lolo



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Sample 1

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#2 1 of 4



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#2 2 of 4

Math 180 Sample Exam

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Page 2 of 3

1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

$$\int_{2}^{\cos x} e^{t^{2}} dt = e^{x^{2}} \cdot 2x = 2x e^{x^{2}} \Big|_{2}^{\cos x}$$

$$2(\cos x) e^{(\cos x)^{2}} - 2(2) e^{x^{2}}$$

$$2\cos x e^{(\cos x)^{2}} - 4e^{x^{2}}$$



Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

M=hx

dn= x dx

findn

findn

findx

Ax

lim hu ene

= ln(ln 20) - ln(ln2) = 20 diveses



7F81CA1E-E0CC-478B-8B72-BA810A2266C4

Sample 1

#2

#3 1 of 4



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#3 2 of 4

Math 180 Sample Exam

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Page 2 of 3

1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

#3 3 of 4



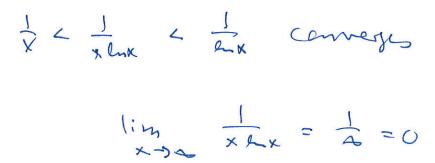
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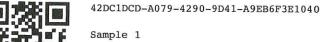
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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$





#3

#4 1 of 4



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Page 2 of 3

1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

$$f(x) = S_0^2 e^{t^2} dt + S_0^{\infty x} e^{t^2} dt$$

$$f(x) = -S_0^2 e^{t^2} dt + S_0^{\infty x} e^{t^2} dt$$

$$f'(x) = -e^{t^2} + e^{\cos^2 x} + C$$

#4 3 of 4



Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

$$= \lim_{b \to \infty} \int_{2}^{b} \frac{dx}{x \ln x} = \lim_{b \to \infty} \int_{2}^{\ln b} u du$$

$$= \lim_{b \to \infty} \left(\frac{u - \ln x}{du} \right) = \lim_{b \to \infty} \left(\frac{\ln b}{2} \right)^{2} = \lim_{b \to \infty} \left(\frac{(\ln b)^{2}}{2} - (\frac{\ln a}{2})^{2} \right)$$

$$= \sum_{b \to \infty} \left(\frac{(\ln b)^{2}}{2} - (\frac{\ln a}{2})^{2} \right)$$

$$= \sum_{b \to \infty} \left(\frac{(\ln b)^{2}}{2} - (\frac{\ln a}{2})^{2} \right)$$



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Sample 1

#4

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#5

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Math 180 Sample Exam

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Page 2 of 3

1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_{2}^{\cos x} e^{t^2} dt \Big)$$

according to the Fundamental Theorem
of Calculus $f'(S_2^{cos \times} e^{t^2} dt) = e^{(cos \times)^2}, - sin \times$ $= -e^{\cos 2x} \sin x$

#5 3 of 4



Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

du= to dis

Diverges!

lim Solder du bosso Inlul lenb losso Inlul lenb

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#5

#6 1 of 4



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Math 180 Sample Exam

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1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

$$f(x) = \int_{x}^{x} e^{t^{2}} dt$$

FTC

#6 3 of 4



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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

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#6

#7 1 of 4



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#7 3 of 4



Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

En 2 July diverges

3) divers by integral test



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#8 1 of 4



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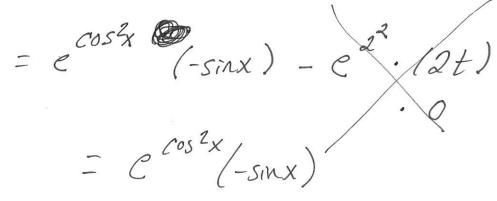
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1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} dt \Big)$$



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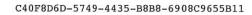
2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_2^\infty \frac{dx}{x \ln x}$$

u=lnx du= xdx

 $= \int_{a}^{\infty} \frac{dn}{n} = \ln u / \frac{1}{2} = \ln \alpha - \ln \alpha = \infty$

diverges





#8 4

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Page 2 of 3

1. (8 points) Evaluate

(8 points) Evaluate
$$\frac{d}{dx} \left(\int_{2}^{\cos x} e^{t^{2}} dt \right) = e^{\left(\cos t^{2} \right)} \left(-\sin x \right)$$

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Math 180 Sample Exam

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Page 3 of 3

2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

$$=\int \frac{d}{dx} = \int \frac{1}{x} \int_{2}^{\infty} = \int \frac{1}{2} = -1 \text{ Converge}$$



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Sample 1

#9

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Math 180 Sample Exam

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1. (8 points) Evaluate

$$\frac{d}{dx} \Big(\int_2^{\cos x} e^{t^2} \ dt \Big)$$

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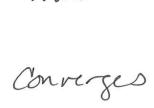
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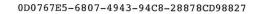
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2. (8 points) Determine whether or not the following improper integral converges or diverges. Rewrite the integral as a limit, and evaluate the integral if it converges.

$$\int_{2}^{\infty} \frac{dx}{x \ln x}$$

$$=\frac{1}{x\ln x} \int_{2}^{\infty} = \frac{1}{x} - \frac{1}{x\ln x}$$







#10