MIDTERM 1
CALCULUS 2

MATH 2300
FALL 2018

Monday, September 24, 2018
5:15 PM to 6:45 PM

Name

PRACTICE EXAM

Please answer all of the questions, and show your work.
You must explain your answers to get credit.
You will be graded on the clarity of your exposition!

1. Evaluate the following integrals:

1.(a). $\int x \ln x dx$

1.(b). $\int x^3 e^{x^2} dx$ [Hint: Make a substitution first.]

1.(c). $\int_0^1 \frac{1}{(x^2+1)^{3/2}} dx$

1.(d). $\int \cos(\ln x) dx$ [Hint: Use integration by parts.]

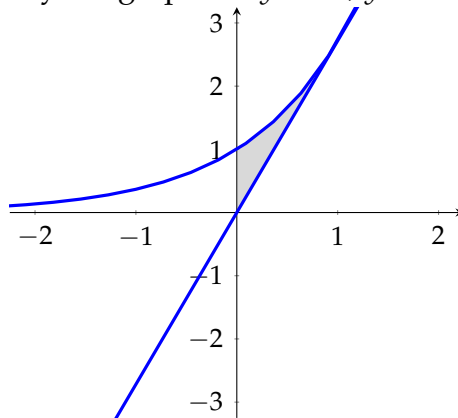**1.(e).** $\int 2 \sin 2x \cdot (\sin x)^2 dx$

1.(f). $\int \frac{5x-1}{(x-1)(x-2)}$

1.(g). $\int \sqrt{25-x^2} dx$

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

2

2. Let R be the region bounded by the graphs of $y = e^x$, $y = ex$ and the $y-$axis.

Set up but do not compute an integral expression for the following:

2.(a). The area of R.

2.(b). The volume of the solid of revolution obtained by rotating R about the x-axis.

3. Determine if the integral $\int_1^\infty \frac{x}{x^2+4}\,dx$ converges or diverges by evaluating the integral.

4. Determine if the integral $\int_0^\infty \frac{1+\sin x}{e^x}dx$ converges or diverges.