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Math 1215, Exam 2 Preparation Package

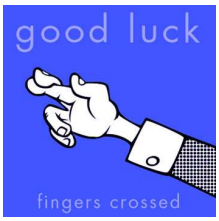
Exam 2 will be on Thursday, March 10, 5 – 5:50 pm.

Please check your room assignments below:
Labs 301, 305, 306, and 310 (Wang) - BCH 120
Labs 302, 303, 307, and 308 (Kovach) - H-SS G5
Labs 304, 309, 311, and 312 (Yuan) - McNutt 204

For DSS students, be sure to be in contact with the Testing Center. Exams will be taken at the same day and time (plus some possible extra time) as the regularly scheduled exam.

If you are sick or in quarantine, e-mail me no later than 4:30 pm on the day before the exam to arrange for alternate testing accommodation at the same day and time as the regularly scheduled exam.

This preparation package contains, besides the information on this page, a list of things that you should know, and a practice exam that features the exact instructions and the same formula sheet as the one on the real exam as well as ten practice problems that are similar to the ones on the real exam. Please work through them. The review on Wednesday will consist of an asynchronous zoom posting of me working out these practice problems.



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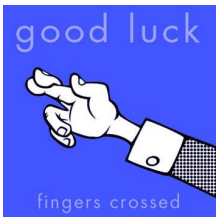
Math 1215, Exam 2

You should be able to do all of the following

1. Be able to do everything that was covered in Exam 1.
2. Know how to do calculus with hyperbolic functions (Section 7.7).
3. Know how to integrate with Calculus 1 methods (Section 8.1).
4. Know how to perform integration by parts (Section 8.2).
5. Know how to evaluate trigonometric integrals (Section 8.3).
6. Know how to perform trigonometric substitutions (Section 8.4).
7. Know how to integrate rational functions using long division and partial fraction decomposition (Section 8.5).
8. Be able to evaluate any integral with the methods from Calculus 1 and the methods from Chapter 8 (Section 8.6).
9. Know how to approximate integrals using the midpoint formula, trapezoid formula, and Simpson's formula (Section 8.8).
10. Decide whether an improper integral (infinite interval of integration or discontinuous integrant) is divergent or convergent. Know how to evaluate convergent integrals (Section 8.9).



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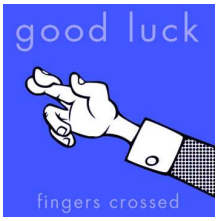
Math 1215, Practice Exam 2

Please print your name in this box	

Instructions

1. Be sure to clearly print your name in the space provided at the top of each page.
2. No calculators, books, or other materials are permitted.
3. This exam has 6 sheets of paper (front and back). *Do not remove the staple!* There are 100 points. Each of the ten problems is 10 points. Once this exam starts, you have 50 minutes. This means you have about 5 minutes for each of the 10 problems.
4. You must write darkly and legibly – this exam will be scanned for electronic grading.
5. Work all problems. Show all work. Full credit will be given only if work is shown which fully justifies your answer.
6. There will be sufficient space under each problem in which to show your work. No extra paper is allowed.
7. Place each final answer in the provided box. *All final answers must be simplified!*
8. **Turn off your cell phone if you have one with you.**

Do not turn this page until told to do so.



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Potentially useful Formulas.

$$L = \int_a^b \sqrt{1 + (f'(x))^2}\,dx$$

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

$$\int \frac{dx}{1+x^2} = \tan^{-1}(x) + c$$

$$\int \frac{dx}{x\sqrt{x^2-1}} = \sec^{-1}|x| + c$$

$$\cos\left(\frac{\pi}{4}\right) = \sin\left(\frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$$

$$\cosh(x) = \frac{e^x + e^{-x}}{2}$$

$$\sinh(x) = \frac{e^x - e^{-x}}{2}$$

$$\cosh^2(x) - \sinh^2(x) = 1$$

$$\sin^2(x) = \frac{1 - \cos(2x)}{2}$$

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

$$M(n) = [f(m_1) + f(m_2) + \ldots + f(m_n)]\,\Delta x$$

$$T(n) = \left[\frac{f(x_0)}{2} + f(x_1) + f(x_2) + \ldots + f(x_{n-1}) + \frac{f(x_n)}{2}\right]\Delta x$$

$$S(n) = [f(x_0) + 4f(x_1) + 2f(x_2) + 4f(x_3) + \ldots + 4f(x_{n-1}) + f(x_n)]\,\frac{\Delta x}{3}$$

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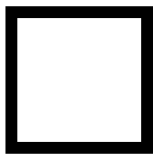
Practice Problem Number 1.

Simplify $\ln(\cosh(2) + \sinh(2))$.

Answer:
(one character per box)



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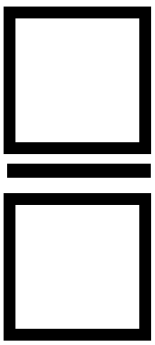
Practice Problem Number 2.

Find the integral $\displaystyle\int_{-3}^{-2} \frac{\mathrm{d}x}{x^2+6x+10}.$

Answer:
(one character per box)



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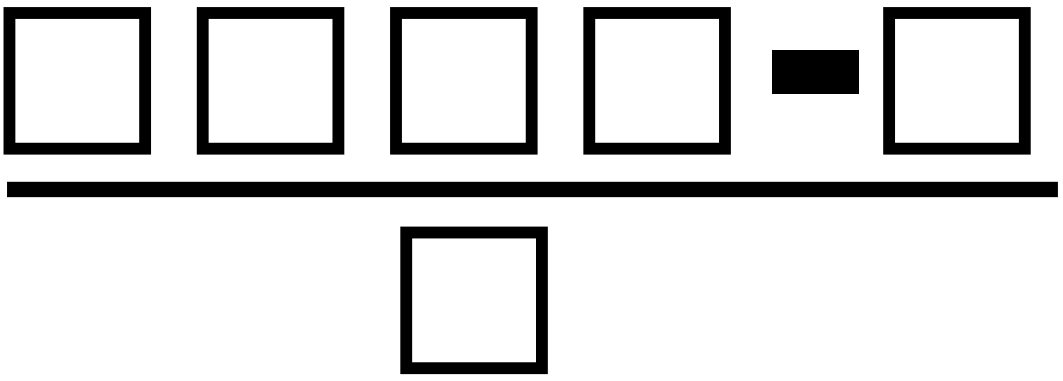
Practice Problem Number 3.

Find the integral $\displaystyle\int_0^{\ln(2)} x\sinh(x)\mathrm{d}x.$

Answer:
(one character per box)



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Practice Problem Number 4.

Consider the u-substitutions

(A) $u = \cos(x)$

(B) $u = \sec(x)$

(C) $u = \sin(x)$

(D) $u = \tan(x)$.

Now put in the first box below the letter that corresponds to the u-substitution that should be done to evaluate the integral

$$\int \sin^6(x)\cos^9(x)\mathrm{d}x,$$

put in the middle box below the letter that corresponds to the u-substitution that should be done to evaluate the integral

$$\int \sin^7(x)\cos^8(x)\mathrm{d}x,$$

and put in the last box below the letter that corresponds to the u-substitution that should be done to evaluate the integral

$$\int \sec^8(x)\tan^4(x)\mathrm{d}x.$$

Answer:
(one character per box)

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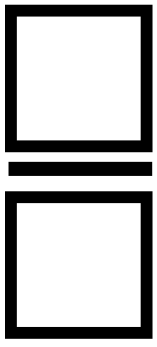
Practice Problem Number 5.

Find the integral $\int_1^2 \sqrt{2x - x^2}\,\mathrm{d}x.$

Answer:
(one character per box)



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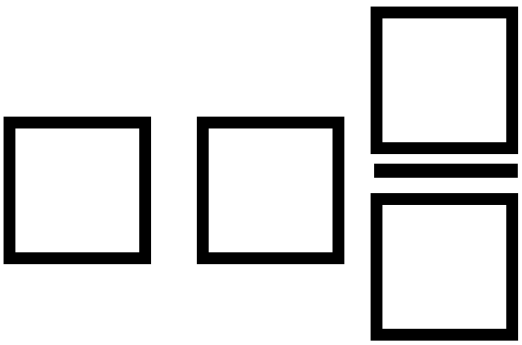
Practice Problem Number 6.

Find the integral $\displaystyle\int_2^3 \frac{2}{x^2-1}\,\mathrm{d}x.$

Answer:
(one character per box)



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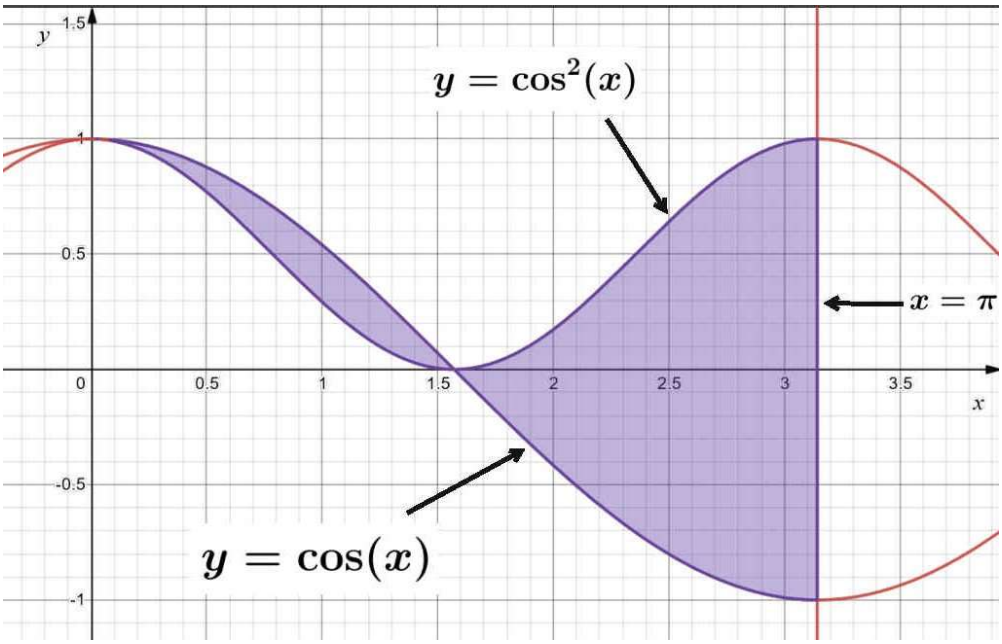
Practice Problem Number 7.

Calculate the shaded area.



Answer:
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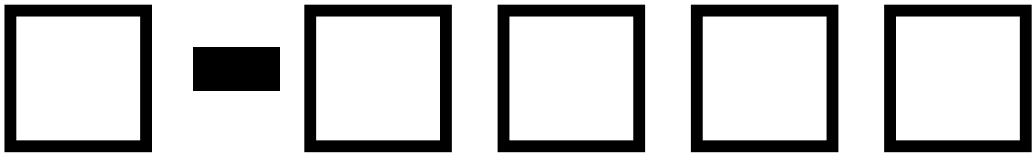
Practice Problem Number 8.

Find the integral $\displaystyle\int_1^2 \frac{\mathrm{d}x}{1+\sqrt{x-1}}$.

Answer:
(one character per box)



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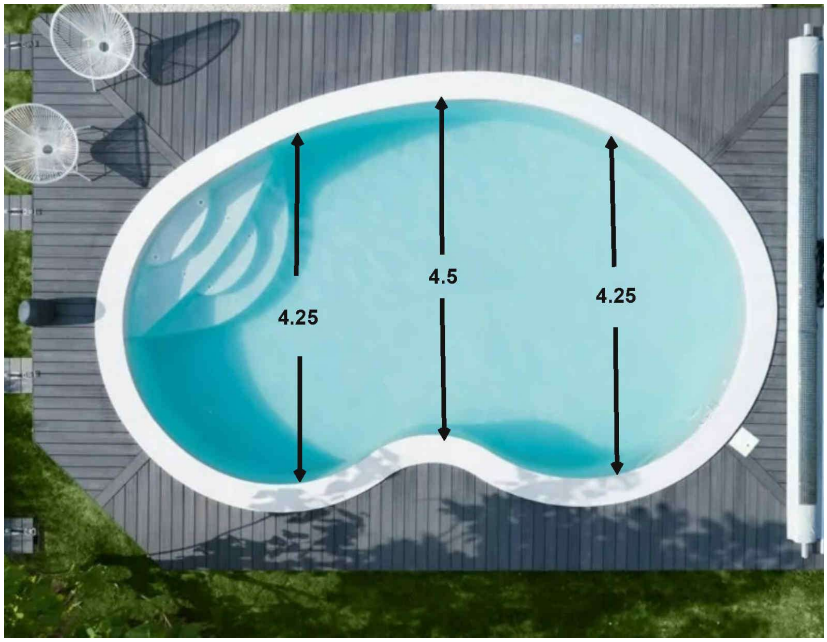
Practice Problem Number 9.

The widths (in meters) of a kidney-shaped swimming pool were measured at 2-meter intervals as indicated in the picture. Use the trapezoid rule to estimate the area of the swimming pool (in square meters).



Answer:
(one character per box)

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Practice Problem Number 10.

Evaluate the improper integral $\displaystyle\int_0^1 \frac{\mathrm{d}x}{\sqrt{x}}$.

Answer:
(one character per box)