TEST PREP on 4.9, 5.1, and 5.2 - Dr. Loveless

Test Prep Format: The format and goals are these...

1. You will start with attempting the first problem on your own for a few minutes.
2. Then you'll compare and discuss with classmates.
3. Then you'll discuss with your TA.
4. After that switch to homework questions and/or ask about other old exam questions.

Participation Code: Please open the participation quiz and answer two short questions to get credit. In the future you will need to be in attendance to get a participation code from your TA.
Notes:

- This problem comes *directly* from the Dr. Loveless old exam archive. You can find solutions in that archive.
- You should picture yourself encountering this question during a test. Could you do it? What surprises or confuses you about the problem? Can you do it efficiently, under time-pressure? Could you check your work and know you are right? These are the questions you should ask yourself as you do each homework question this term and as you practice on old exams.

Spring 2017 - Exam 1 - Problem 1(a) - Dr. Loveless: *Simplify and integrate*
(*this was half of a page on this exam, a good goal is to try to complete it in under 4 minutes*).

1(a) Evaluate $\displaystyle\int \frac{4}{\sqrt{x}} + x^4\left(\frac{3}{4x^5} - \frac{x^2}{2}\right) + \sec^2(5x)\,dx$

Once you are all sure you have this question correct, talk to your TA about what you want to do next. You could discuss homework and/or you could discuss more old exam problems. I would ideally like you to discuss some homework, but if you run out of questions, then you can use the old exam questions on the next page for more discussion topics. In any case, the next page has several problems for you to practice your understanding.

Winter 2019 - Exam 1 - Problem 4(a) - Dr. Loveless: *Constants of Integration*

4(a) Find $f(x)$, if $f''(x) = 28\sqrt[3]{x} - 6x$, $f(0) = 5$ and $f(1) = 10$. Put a box around your answer.

Winter 2017 - Exam 1 - Problem 2(b) - Dr. Loveless: *Riemann Sum concept*
Part (b) of this questions relates to the section 5.3 (fundamental theorem of calculus part 1), so just do part (a) for now. Part (b) will be fast and easy after section 5.3, so come back to this after that.

1. A table of values for an increasing function f are given:

x	3	3.5	4	4.5	5	5.5	6
$f(x)$	1	3	6	9	12	15	20

   (a) Approximate the value of $\int_3^5 f(x)\,dx$ using left-endpoints with $n = 4$ subdivisions.

   (b) Let $g(x) = \int_3^{x^2+x} f(t)\,dt$. Find the value of the *derivative* of $g(x)$ at $x = 2$.
   That is, compute $g'(2)$.

Winter 2019 - Exam 1 - Problem 3(a) - Dr. Loveless: *Riemann Sum notation*

3 Leave your answers in exact form, but **simplify your final answers**.

   (a) Consider $\lim_{n\to\infty} \sum_{i=1}^{n} \left(1 + \frac{3i}{n}\right)^2 \cdot \frac{3}{n}$. Rewrite this as an integral and evaluate the integral.