Midterm #1 Information

All this can be found on the course web page

- In class (here) on Friday (January 30th); 50 minutes
- Covers material from WeBWorK #1–3
- Bring ID, writing implement (non-red pen or dark pencil)
- Completely closed book, no calculators
- Format very similar to practice midterms
- Show your work (better = more partial credit)
- You are responsible for not cheating
- Remember to breathe deeply! Every problem on the exam has been carefully crafted to make sure you know how to solve it.

Monday, January 26

Clicker Questions

Clicker Question 1

Combining average values

Suppose the average value of a function $f(x)$ on the interval $[1, 2]$ equals 12, while the average value of the same function on the interval $[2, 6]$ equals 2. What is the average value of $f(x)$ on the inteval $[1, 6]$? Example of such a function: $f(x) = 24/x^2$.

Warning and hint

The answer *isn't* 7! Consider $\int_1^6 f(x)\,dx = \int_1^2 f(x)\,dx + \int_2^6 f(x)\,dx$.

A. 14

B. $\sqrt{24}$

C. 10

D. 4

E. more information is needed

Step by step

$\frac{1}{2-1}\int_1^2 f(x)\,dx = 12$, so $\int_1^2 f(x)\,dx = 12$.

$\frac{1}{6-2}\int_2^6 f(x)\,dx = 2$, so $\int_2^6 f(x)\,dx = 8$.

So $\int_1^6 f(x)\,dx = 12 + 8 = 20$, which means $\frac{1}{6-1}\int_1^6 f(x)\,dx = 4$.

Clicker Question 2

An easy Product Rule

The derivative of $x \sin x$ is $x \cos x + \sin x$.

A tricky antiderivative

What is $\int x \cos x \, dx$?

A. $x \sin x - \sin x + C$

B. $x \sin x + \sin x + C$

C. $x \sin x - \cos x + C$

D. $x \sin x + \cos x + C$ has derivative $(x \cos x + \sin x) - \sin x$

E. none of the above