Good afternoon: assessments are being passed back
We will use peer experts to go over some questions

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3 Zavier
4 Anna D
6 Mitchell
7 Virginia

Follow closely, ask them questions, make legible corrections in notes

2. $\int 2x(x-1)^2\,dx$

$2x(x^2-2x+1)$

$\int 2x^3 - 4x^2 + 2x$

$2 \cdot \frac{1}{4}x^4$

Ax^n

$\boxed{\frac{1}{2}x^4 - \frac{4}{3}x^3 + x^2} + C$

$\frac{1}{2}x^4 - 4 \cdot \frac{1}{3}x^3 + 2 \cdot \frac{1}{2}x^2$

3. $\int \frac{6\sqrt{x}-6x}{2\sqrt{x}}\,dx$

$=$

$\frac{6x^{1/2}}{2x^{1/2}} - \frac{6x}{2^{1/2}}$

$\int 3 - 3x^{1/2}\,dx$

$\frac{3x}{1} - \frac{3x^{3/2}}{3/2}$

$3x - \frac{2}{3}\cdot 3\,x^{3/2}$

$3x - \frac{6}{3}x^{3/2}$

$= 3x - 2x^{3/2} + C$

$= 3x - 2\sqrt[2]{x^3} + C$

$\frac{A-B}{C} = \frac{A}{C} - \frac{B}{C}$

$\frac{A}{B+C} \neq \frac{A}{B} + \frac{A}{C}$

$\int \_\_ + \_\_ + \_\_ - \_\_$

4. $\int \frac{2x^3+8x^2-10x}{x-1}\,dx$

$2x(x^2+4x-5)$

$\frac{2x\cancel{(x-1)}(x+5)}{\cancel{(x-1)}}$

$2x^2+10x$

$\boxed{\frac{2}{3}x^3+5x^2+C}$

SELF: I-A2a

6. $\cdot -4\int \left(-24x^2\right)\sin\left(2x^3+3\right)dx \cdot \frac{-1}{4}$ $\longrightarrow -4\int \boxed{\cancel{6x^2}} \sin\left(2x^3+3\right)dx$

want $6x^2$

$-4\int \sin\left(2x^3+3\right)dx \qquad -4\left(-\cos\left(2x^3+3\right)\right)$

$4\cos\left(2x^3+3\right)+C$ ✓

* negatives canceled

7. $$\int -\frac{10e^{5x}}{e^{5x}+4}\,dx$$

$$-10e^{5x} \cdot \frac{1}{\underbrace{e^{5x}+4}_{5e^{5x}}}$$

-2

$$-2\int \frac{1}{e^{5x}+4} = \boxed{-2\ln\left|e^{5x}+4\right|+C}$$

$$\frac{d}{dx}e^{x} = e^{x}$$

$$\frac{d}{dx}e^{f(x)} = f'(x)e^{f(x)}$$

$$-10\ln\left|e^{5x}+4\right|+C$$

visibly random grouping

HW from last week p 288 #5-20...

integrate, leave off C
plug in B, plug in A
subtract

just check with a calculator! math-9

or in Desmos

$$\int_3^2 x^2 + 5 \, dx$$

Questions on how to take any of the antiderivatives??

1(f)

$$\int_{-1}^{1} \sqrt[3]{t} - 2 \, dt$$

$$t^{1/3} - 2$$

$$\left. \frac{3}{4} t^{4/3} - 2t \right]_{-1}^{1}$$

$$\left(\frac{3}{4} - 2\right) - \left(\frac{3}{4} + 2\right)$$

$$\cancel{\frac{3}{4}} - 2 - \cancel{\frac{3}{4}} - 2 = -4$$

$$(-1)^{4/3}$$

$$\left((-1)^{1/3}\right)^{4}$$

$$\left((-1)^{4}\right)^{1/3}$$

What have we learned lately?

- What is a definite integral in the context of area under curve
- How to approximate definite integrals (L, R, Mid, Trapez.)
- Approximating integrals from a table
- Moving between integral and Riemann Sum notation
- *How to find exact value of definite integral
- Properties of definite integrals (video last night)

$$\int_3^7 \sin(x)\,dx \rightleftharpoons \lim_{n\to\infty} \sum_{i=1}^{n} \sin\left(3+\frac{4i}{n}\right)\cdot\frac{4}{n}$$

Using Properties of Definite Integrals

Given $\int_{-1}^{1} f(x)\,dx = 0$ and $\int_{0}^{1} f(x)\,dx = 5$, evaluate

(a) $\int_{-1}^{0} f(x)\,dx$ $= -5$

(b) $\int_{0}^{1} f(x)\,dx - \int_{-1}^{0} f(x)\,dx$ $\quad 5 - -5 \quad 10$

(c) $\int_{-1}^{1} 3f(x)\,dx$. $\quad 0$

(d) $\int_{0}^{1} 3f(x)\,dx$.

$$\int_a^b = -\int_b^a$$

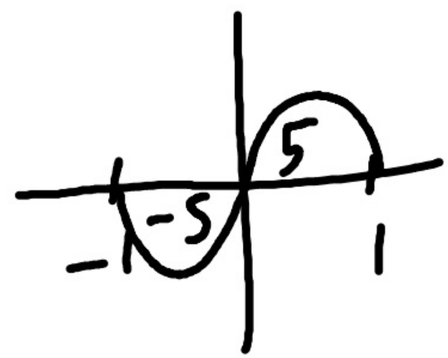
$$\int_a^b = \int_a^c + \int_c^b$$

a) $\int_{-1}^{0} = \int_{-1}^{1} + \int_{1}^{0}$

c.) $3\int_{-1}^{1}$

$\int_{-1}^{1} + -\int_{0}^{1}$

$0 - 5$



917. Suppose f and g are continuous and that

$$\int_1^2 f(x)\,dx = -4, \qquad \int_1^5 f(x)\,dx = 6, \qquad \int_1^5 g(x)\,dx = 8.$$

Evaluate the following definite integrals.

a) $\int_2^2 g(x)\,dx$ duh $= 0$

b) $\int_5^1 g(x)\,dx$ $= -8$

c) $\int_1^2 3f(x)\,dx$ $= -12$

d) $\int_2^5 f(x)\,dx$

e) $\int_1^5 [f(x) - g(x)]\,dx$ $= -2$

f) $\int_1^5 [4f(x) - g(x)]\,dx$ $= 16$

b) $\int_5^1 = -\boxed{\int_1^5}$

c) $3\boxed{\int_1^2 f(x)}$

$\int_1^5 f - \int_1^5 g$

$6 - 8$

d) $\int_2^5 = \int_2^1 + \int_1^5 = -\int_1^2 + \int_1^5$

$--4 + 6 = 10$

Practicing Integral Skills

For your assigned definite integral:

a.) Graph the integrand on graph paper using reasonable axes.

b.) Approximate with LRAM and trapezoids. with given n (draw shapes in different colors, show work)

c.) Express the definite integral as an infinite Riemann sum.

d.) Exact value of the integral by using the FTC2

e.) Make a mini-poster with all of this information organized nicely

Trap: $\frac{\Delta x}{2}\left[f(a)+2(\underbrace{\quad\quad}_{\text{rest of interval except last}})+f(b)\right]$

HW

p. 274 #37-42 (properties of definite integrals)