

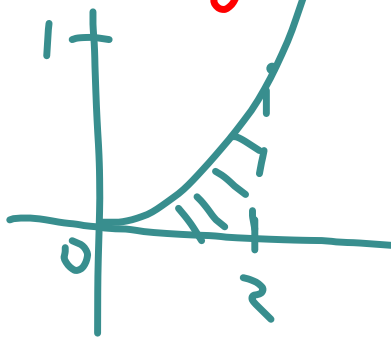
MON 02-06-06

AP WHITE (43) D

P.267-8 ?

(35)

$$\int_0^2 \left(\frac{x}{2}\right)^3 dx$$

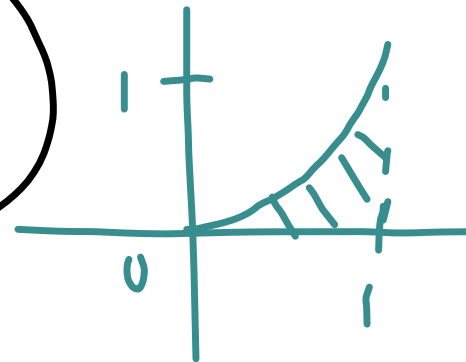


col -

$$\int_0^2 x^3 dx$$

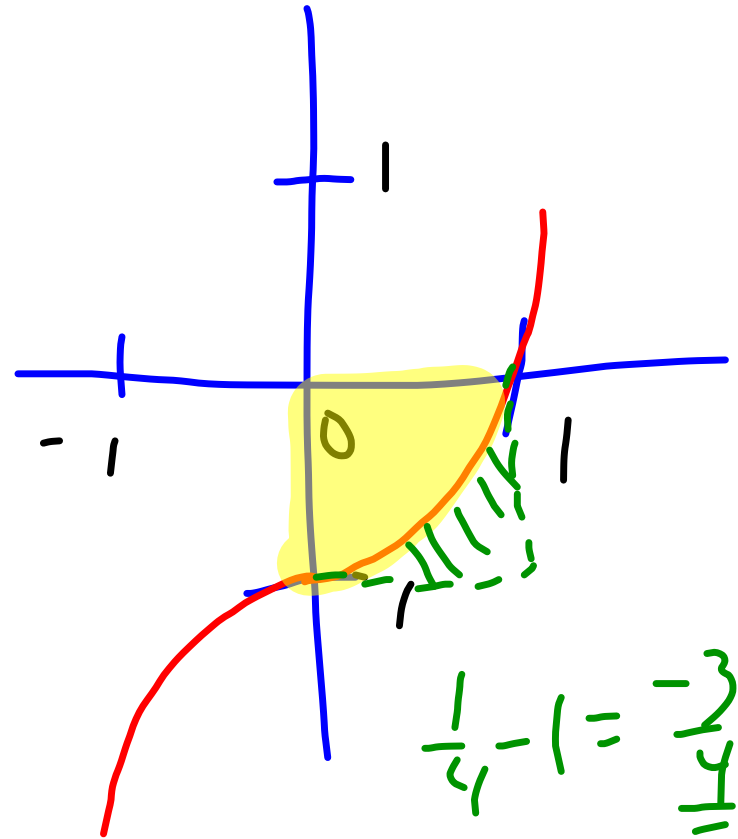
BAD

$$\int_0^1 x^3 dx = \frac{1}{4}$$



(37)

$$\int_0^1 (x^3 - 1) dx$$



P.274-5

Q. REV. #7

$$y = \frac{1}{n+1} \cdot x^{n+1}$$

$$y = 6x^6$$
$$y' = 36x^5$$

$$\frac{dy}{dx} = \frac{n+1 \cdot 1}{n+1} x^n$$

$$\underline{\underline{\frac{dy}{dx} = x^n}}$$

EXPLORATION

$$\int x^3 dx$$

AT LEAST
2 ANSWERS

"FIND THE ANTIDERIVATIVE OF"
(AN)

$$\frac{1}{4}x^4 + 1$$

$$\frac{x^4}{4} + 1,000,000$$

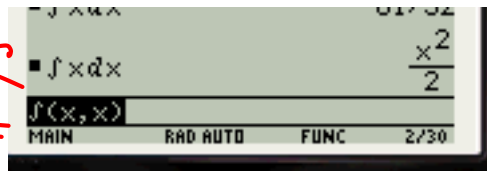
GENERIC
ANSWER:

$$\int x^3 dx = \frac{1}{4}x^4 + C$$

SOME
CONSTANT

TI-89 EXPLORATION

$$\int x dx = \underline{\underline{\frac{1}{2}x^2 + C}}$$



$$\int x^2 dx = \frac{1}{3}x^3 + C$$

$$\int x^3 dx = \frac{1}{4}x^4 + C$$

GENERALIZE:

$$\int x^n dx = \frac{1}{n+1} \cdot x^{n+1} + C \quad (n \neq -1)$$

$$\int x^{-1} dx = \int \frac{1}{x} dx = ? \quad \underline{\underline{\ln x + C}}$$

Ex) $\int (2x^3 - x^2 + 5) dx$

$5x^0$

$\frac{5}{1}x^1$

$$= \int 2x^3 dx - \int x^2 dx + \int 5 dx$$
$$= 2 \cdot \frac{1}{4}x^4 - \frac{1}{3}x^3 + 5x + C$$
$$= \underline{\underline{\frac{1}{2}x^4 - \frac{1}{3}x^3 + 5x + C}}$$

$$\int \frac{1}{x^2} dx = \int x^{-2} dx$$

$$= \frac{1}{-2+1} \cdot x^{-2+1} + C$$

$$= \frac{1}{-1} \cdot x^{-1} + C$$

$$= \underline{\underline{-\frac{1}{x} + C}}$$

ANTI-DERIVATIVES

S

O.T.L. THIS GIFT 1-18(ALC):

AP CALCULUS GIFT 5.3

1 – 15. Compute the following antiderivatives. CHECK YOUR ANSWERS. And, yes, you will have to go back and review some differentiation formulas. That is normal. BUT DO IT!!!

1. $\int 2x \, dx$

2. $\int 3t^2 \, dt$

3. $\int 6 \, dx$

4. $\int y^6 \, dy$

5. $\int \cos \theta \, d\theta$

6. $\int e^y \, dy$

7. $\int \frac{1}{x} \, dx$

8. $\int 4^u \ln 4 \, du$

9. $\int \frac{1}{\sqrt{1-u^2}} \, du$

10. $\int -3t \, dt$

11. $\int 5t^4 \, dt$

12. $\int \frac{1}{2} \, du$

13. $\int \sin x \, dx$

14. $\int \frac{1}{u \ln 3} \, du$

15. $\int \frac{1}{1+t^2} \, dt$

16 – 18. Compute these integrals graphically.

16. $\int_{-2}^3 4 \, dx$

17. $\int_2^4 [t] \, dt$

18. $f(x) = \begin{cases} |x| & x \leq 1 \\ 2 & x > 1 \end{cases}$

$$\int_{-3}^4 f(x) \, dx$$

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