

Crash + Return Quiz!

Mon. 9/18
 I, Finish review of volume by shell
 II, Inverse trigonometric substitution:

$$A. \int_{1/4}^{1/2} \frac{dx}{x\sqrt{1-x^2}} = \int_{\theta_0}^{\pi/6} \frac{\cos\theta d\theta}{\sin\theta \cos\theta}$$

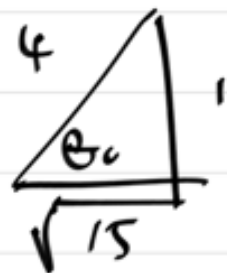
let $\theta = \sin^{-1} x \Leftrightarrow$
 $x = \sin\theta$

$$= \int \cancel{\cos\theta} \theta d\theta = -\ln|\csc\theta + \cot\theta|$$

$dx = \cos\theta d\theta$

= ...

Reminder that



$\ln| -1 | =$
 $\ln| -1 |.$

Then go over sample quiz

$$B. \int_0^2 \frac{x^2 dx}{\sqrt{9-x^2}} = \int_0^{\theta_1} \frac{3\sin\theta \cdot 3\cos\theta d\theta}{\sqrt{9-9\sin^2\theta}}$$

let $\theta = \sin^{-1}(\frac{x}{3})$

$\Leftrightarrow x = 3\sin\theta$

$\Rightarrow dx = 3\cos\theta d\theta$

$$= 3 \int_0^{\theta_1} \sin\theta d\theta = \dots$$

but then finish!

C, For them: $\int_0^{\frac{3}{4}} \frac{dx}{\sqrt{9-4x^2}}$

↑ III. Sample Quiz.

Tues
9/19

I. For them: A. $\int_2^3 \frac{dx}{\sqrt{x^2-1}}$

B. $\int_2^3 \frac{dx}{\sqrt{9x^2-16}}$

C. $\int_2^3 \sqrt{x^2+1} dx$

D. $\int_1^2 \sqrt{16x^2+9} dx$

As we go along,
bring in how notes
relate to factoring.

Wed
9/20

Partial Fraction Technique For them.

I. A. $\int \frac{x^2+x+1}{x^3-6x^2+11x-6} dx$ B. $\int \frac{x+1}{x^3-6x^2+11x-6} dx$

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

$$D. \int \frac{x^5 + x^3 - x + 1}{x^3 - x^2 + x - 1} dx$$

$$E. \int \frac{5x^8 + \dots}{(x^2 + 1)^3 (x - 1)^2 (x + 1)} dx$$

$$F. \int \frac{x^3 - 2x + 1}{(x^2 + 1)^2 (x^2 - 1)^2} dx \quad (\text{Set up only})$$

Thus
9/21

Sometimes you have to complete the square. Ex. $\int \frac{x^2 - 3x + 7}{(x^2 - 4x + 6)^2} dx$
 ~ No real roots

Add'l Examples:

$$A. \frac{x^5 - 1}{(x^2 - x)(x^4 + 2x^2 + 1)} = \dots$$

$$B. \int \frac{5x^4 + 7x^2 + x + 2}{x(x^2 + 1)^2} dx$$

$$C. \int \frac{x^5 + x - 1}{x^3 + 1} dx$$

$$D. \int \frac{x^3 + 2x^2 + 3x - 2}{(x^2 + 2x + 2)^2} dx$$

Fri
9/22

Catch up, Questions, Quiz.