

WARM UP

1. $\int \arctan x dx$

2. The average value of $\frac{1}{x}$ on the closed interval $[1,3]$ is

(A) $\frac{1}{2}$

(B) $\frac{2}{3}$

(C) $\frac{\ln 2}{2}$

(D) $\frac{\ln 3}{2}$

(E) $\ln 3$

INTEGRATION BY PARTS

Day 2

Objective:

- Integrate using parts.
- Solve a variety of problems using integration by parts.

Example 1: $\int e^x \cos x dx$

Example 2: Find the volume when $y = \ln x$ is rotated about the x-axis between $x = 1$ and $x = e$.

Example 3: $\int \frac{e^x}{\csc x} dx$

Example 4:

x	1	3
$h(x)$	3	3
$g(x)$	2	11
$g'(x)$	1	4
$g''(x)$	7	5

If $h'(x) = 6$ for all values of x , what is the value of

$$\int_1^3 h(x)g''(x)dx$$

Example 5:

$$\text{Solve } \frac{dz}{dx} = x^3 \ln x, \text{ if } z = 5 \text{ when } x = 1$$