Math 1432

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Office Hours:

Mondays 1-2pm,
Fridays noon-1pm
(also available by appointment)

Class webpage:

http://www.math.uh.edu/~bekki/Math1432.html

Email questions for Wednesday's notes before Tuesday at 4pm

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1. $\int x e^{x^2}\, dx =$

What if we had $\int x\,\mathrm{e}^{x}\,dx$?

Section 8.1 - Integration by parts

("Undoing" the product rule)

Lets start with the product rule:

$$\frac{d}{dx}(uv) = u\frac{d}{dx}v + v\frac{d}{dx}u$$

So, the integration by parts formula is:

$$\int u\,dv = uv - \int v\,du$$

We use it to "undo" the product rule.

1. Reduction to integrate

   $x^n \sin(ax),\ x^n \cos(ax),\ x^n e^{ax},$

   $polynomial \cdot \sin(ax),\ polynomial \cdot \cos(ax),\ polynomial \cdot e^{ax}$

2. Cycling to integrate

   $\cos(ax)\sin(bx),\ \cos(ax)e^{bx},\ \sin(ax)e^{bx}$

3. Change of Form to integrate

   $\ln(x)f(x),\ \arctan(x)f(x),\ \arcsin(x)f(x)$

   (where $f(x)$ has a simple antiderivative)

How do you know what to pick for u and for dv?

"Shortcut"

ILATE

I –

L –

A –

T –

E –

1. $\int x e^{x}\, dx$

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2. $\int \frac{1}{9+x^2}\,dx =$

3. Give the formula for the area enclosed by $y=x^2$ and $y=3-x^2$

4. Give the x value of the centroid for the region enclosed by $y=x^2$ and $y=3-x^2$

5. Give the formula for the volume when the region enclosed by $y=x^2$ and $y=3-x^2$ *in the first quadrant* is revolved about the y – axis