

Exam #1 Tips

Math 231 AD1

1. Don't fall for easy mistakes:

$$\sqrt{a+b} \neq \sqrt{a} + \sqrt{b} \quad (a+b)^n \neq a^n + b^n \quad \tan^{-1}(x) \neq \frac{1}{\tan(x)}.$$

2. Don't lose points for laziness:

$dx, d\theta, du$ —these ARE important and can't be omitted.

Same thing goes for $\lim_{t \rightarrow \infty} \dots$

3. For *indefinite* integrals $\int f(x) dx$, the final answer must be written in terms of x .

Don't forget the $+C$.

4. For *definite* integrals $\int_a^b f(x) dx$, the final answer is a *number*.

Also if you use a substitution, *change the limits!*

5. Integration by Parts (IBP): Choose u according to LIATE:

Log, Inverse Trig, Algebraic, Trig, Exponential.

6. Don't confuse IBP with u -substitution: If you need both methods, I recommend using a different variable, for example w instead of u , for the substitution.

7. Are you solid on your derivatives?

Derivatives of $\arcsin(x)$, $\arccos(x)$, $\operatorname{arcsec}(x)$, etc. are uncommon, but could show up.

If you see one of their derivatives show up in an integral, then the integral just became a lot easier!

8. In section 7.2 (Trig integrals), there are five red boxes:

Know them and be able to use them without hesitation.

9. When you have a rational function (polynomial divided by another polynomial), you may need partial fractions: First, check that the power in the denominator is greater than the power in the numerator. Otherwise, you'll need long division first.

10. In section 7.7 (approximation), there are five more red boxes:

Know them and be able to use them without hesitation.

(If the professor said Simpson's rule is not on the exam, you may ignore the last two).