Do Not Look at the Second Page Until You Are Told To Do So.

- The second page shows all of the qualifying problems for the Integration Bee, and has spaces for you to write your answers.
- Do not do scratch work on the answer page. Do not write anything on the answer page except for your name, student ID, and your answers.
- All your scratch work should be done on the scratch paper. Keep it organized and clearly labelled, and turn all of it in.

- There is no partial credit.
- **Exception:** If we need to break ties to get an appropriate number of contestants, we’ll check your scratch work and may award fractional points. We will only look for scratch work on problems that you answered incorrectly. If you leave a question blank, we will not look at scratch work for that problem.

- Your answers must be in terms of \( x \).
- You do not need to include \( +C \) in your answers.
- You do not need to include absolute value bars around arguments of log functions. (That is to say, \( \ln x \) and \( \ln|x| \) are equally acceptable.)
- You will have 30 minutes work on the integrals.

- The Bee will begin at 2:45 on Friday afternoon (April 13) in Raef 160 at American River College. It will begin with an announcement of the contestants (the top scorers on these problems).

Good Luck!
**ARC Integration Bee**

*Have fun on the problems!

\[ \int x^2 \ln x \, dx \]

\[ \int \left(3e^x - 2e^{-x}\right)^2 \, dx \]

\[ \int \frac{1}{x^3 - x} \, dx \]

\[ \int \sqrt{1 - 9x^2} \, dx \]

\[ \int x \arcsin x \, dx \]

\[ \int \cos^2(x) \cos x \, dx \]

\[ \int \frac{1}{\sqrt{x} \cos \sqrt{x}} \, dx \]

\[ \int \frac{dx}{x\sqrt{x^2 + 4}} \]
\[ \int (\sec x)(x^3 \tan x + 4x^2) \, dx \]
\[ \int \frac{1}{x^2 - 2x + 5} \, dx \]
\[ \int \sin \sqrt{x} \, dx \]
\[ \int e^{\sqrt{x}} \, dx \]
\[ \int \sin(\sin x) \cos(\sin x) \cos x \, dx \]
\[ \int \frac{e^{x/2}}{1 + e^x} \, dx \]
\[ \int \sqrt{\left(\frac{x^2 - x}{\sqrt{x}} + \sqrt{x}\right)} \, dx \]
\[ \int \frac{3}{x^5} \sqrt{\frac{x^4 + 1}{x^4}} \, dx \]
\[ \int \frac{1 - \tan x}{1 + \tan x} \, dx \]
\[ \int e^{3x} \arctan(e^x) \, dx \]
American River College Annual Integration Bee 2018
Permission Slip

Where: American River College, Raef Hall Room #160
4700 College Oak Drive
Sacramento, CA 95841

When: Friday, April 13 2:30 pm – 5:30 pm or later

Prizes:

- 1st place = $600
- 2nd place = $400
- 3rd place = $250
- 4th place = $150
- 5th place = $125

*t-shirts will be given to all qualifiers.
**All qualifiers (Not top 5) will receive a $20 gift card.

I give permission for my child ______________________ to attend the Integration Bee on Friday, April 13 at American River College in Raef Hall Room #160. I will arrange transportation for my child to and from the event. ***Spectators are welcome to the event.

Parent/Guardian Signature ____________________________

Phone Number ______________________________

Name of High School child attends _______________________

If you have any questions please contact Professor Glen Pico at PicoG@arc.losrios.edu or (916) 484 – 8963.