1. As a group, share your HOT topic portfolio Standard 1 questions with each other (you can add screenshots to a shared Google doc, for example). If anyone needs help determining which of their HOT topic portfolio questions aligns with Standard 1, help them figure out which one it is. What do all of your problems have in common? Discuss *how* you knew this was the Standard 1 question.
2. Choose *one* of the group member's Standard 1 questions to solve as a group. (You can all write on the BCU whiteboard, for example.)
3. As a group, write up a careful solution for the Standard 1 problem that includes a written description of what is happening at each step. Highlight which of the steps are most important in terms of meeting Standard 1.
4. Repeat steps 3, 4, and 5 with your Standard 2 questions.
5. As a group, write up a careful solution for the Standard 1 problem that includes a written description of what is happening at each step. Highlight which of the steps are most important in terms of meeting Standard 1.

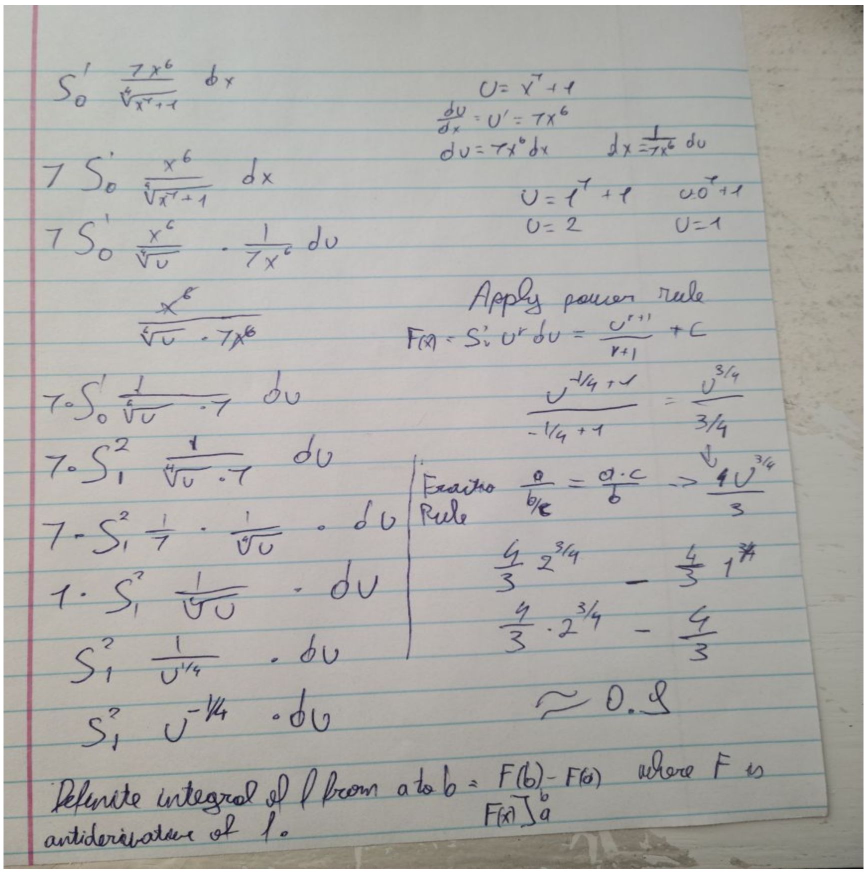
Review your group's community agreement. Discuss the other groups' agreements. What did you think of the other groups' agreements? Do you want to update your group's agreement based on what you saw?

As a group we came to the conclusion that we did not need to update our groups agreement. We thought that our group's agreement was similar to everyone else's.

All the steps to solving standard one question. (The ones in Bold are the most important)

- **Firstly we decide what part of the question we are going to use as u, from there we can find du and dx.**
- After that we put constant on the left.
- After separating the constant we can substitute values for u and dx

- **Since we now have du in the end of the question we have to find the new limits by substituting the values of x to the u.**
- We continue solving with algebra until we get the the most simple form
- **From there we apply the Power Rule**
- **Now we can subtract F(b) from F(a) where F is the antiderivative of f, and this way we get a solution to the problem**

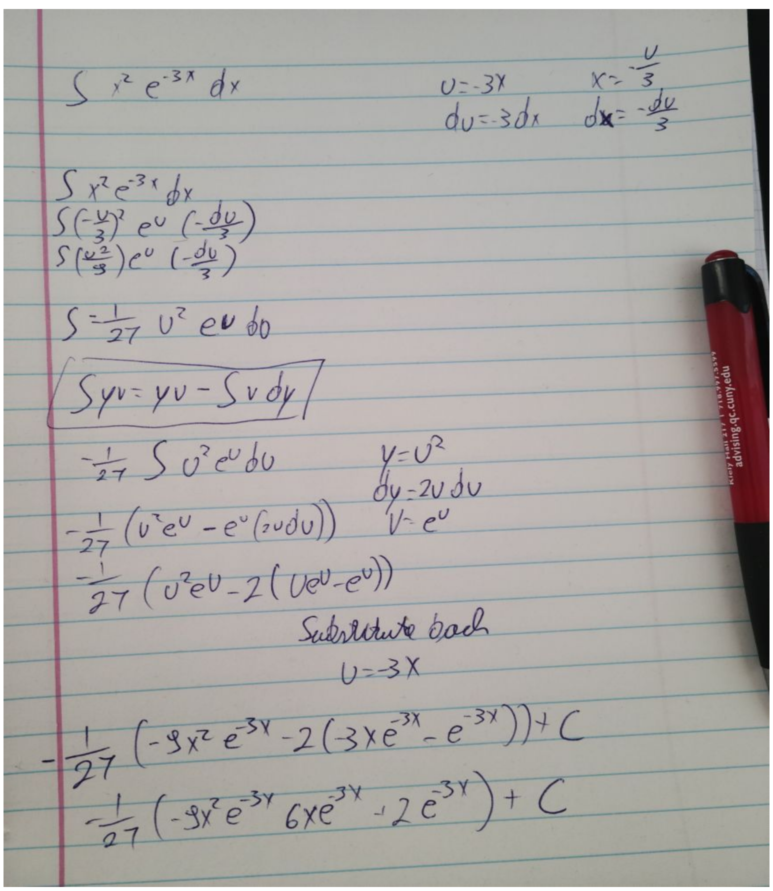


Why we knew it was a Standard 1 question?

- The goal was to Evaluate definite and indefinite integrals by substitution
- Our main priority when applying integration technique is to determine what the function "U" should be.
- "U" appears in the integrand as the "inside" function of a composition and its derivative "du" also appears as a factor.
- An indefinite integral is a general antiderivative.
- A definite integral is a signed area.

- $$\int_0^2 f(x)dx$$
- Definite integral has a lower and upper limit of integration
- A Definite Integral has start and end values: in other words there is an interval [a, b].

Standard 2 question Solved



$\int x^2 e^{-3x} dx$ $\quad u=-3x \quad x=-\frac{u}{3}$

$du=-3dx \quad dx=-\frac{du}{3}$

$\int x^2 e^{-3x} dx$

$\int (-\frac{u}{3})^2 e^u (-\frac{du}{3})$

$\int (\frac{u^2}{9}) e^u (-\frac{du}{3})$

$\int -\frac{1}{27} u^2 e^u du$

$\boxed{\int yv = yv - \int v\, dy}$

$-\frac{1}{27} \int u^2 e^u du \quad y=u^2$

$dy=2u\,du$

$-\frac{1}{27}(u^2e^u - e^u(2u\,du)) \quad v=e^u$

$-\frac{1}{27}(u^2e^u - 2(ue^u - e^u))$

Substitute back

$u=-3x$

$-\frac{1}{27}(-9x^2e^{-3x} - 2(-3xe^{-3x} - e^{-3x})) + C$

$-\frac{1}{27}(-9x^2e^{-3x}\ 6xe^{-3x} + 2e^{-3x}) + C$