substitution step by step

Warning: *by now the integral should be solely in terms of* u.

If there are still terms containing x at this stage, stop and consider another choice of u.

substitution step by step

1. Choose a suitable $u = u(x)$. Your choice should not be a constant function
2. Work out $u'(x)$ and write down an expression for $dx = du/u'(x)$. If you are considering a definite integral, work out $u(a)$ and $u(b)$ where a and b are the limits of the integral
3. Next
   - replace every instance of $u(x)$ with the letter u
   - replace dx with $d(u)/u'(x)$ and cancel
   - (for definite integrals only) replace a with the value $u(a)$ and b with $u(b)$

   Warning: *by now the integral should be solely in terms of u.*
   If there are still terms containing x at this stage, stop and consider another choice of u.
4. If you can, work out the integral (don't forget $+C$ if you are working with indefinite integrals)
5. This step only for indefinite integrals: Your antiderivative should be in terms of u. Replace every instance of u with the original function $u(x)$.

substitution