MATB41 - Fall 2020

Final Exam - Dec 17, 2020

Instructor: Xiao Jie

First Name: _____

Last Name: _____

UTor email: _____ @mail.utoronto.ca

Signature: _____

We at the University of Toronto want you to feel proud of what you accomplish as students. Please respect all of the hard work youve done this year as you complete the following assessment of your learning by making sure that the work you do here is your own. We dont expect you to score perfectly on this assessment and there will be some things that you may not know. Using an unauthorized resource or asking someone else for the answer robs you of the chance later to feel proud of how well you did because youll know that it wasnt really your work that got you there. Success in university isnt about getting a certain mark, its about becoming the very best person you can by enriching yourself with knowledge, strengthening yourself with skills, and building a healthy self-esteem based on how much youve grown and achieved. No one assessment captures that but your conscience will stay with you forever. Make yourself and your loved ones proud of the student that you are by conducting yourself honestly on this assessment.

I, (full name here)_____ ,

University of Toronto student number _____,

pledge to honour myself and my community by assuring that the work I do on this assessment fully represents my own knowledge and ideas. I will feel proud of my work here when I am done because I know that it was my own and only mine.

Question 1. [10 marks]

Consider the surface created by

$$\sqrt{x^2+y^2+z^2} = 1 - \frac{z}{\sqrt{x^2+y^2+z^2}}$$

1. [5 marks] Plot the surface as a curve on the rz-plane (with only $r \geq 0$).
   Strategy: Use a suitable coordinate.
2. [5 marks] Find the volume enclosed by the surface.