National University of Technology, Islamabad
Quiz VII (Calculus II), Spring 2019
Solution Key

Q.1 Evaluate the volume of the prism in figure below using triple integrals.

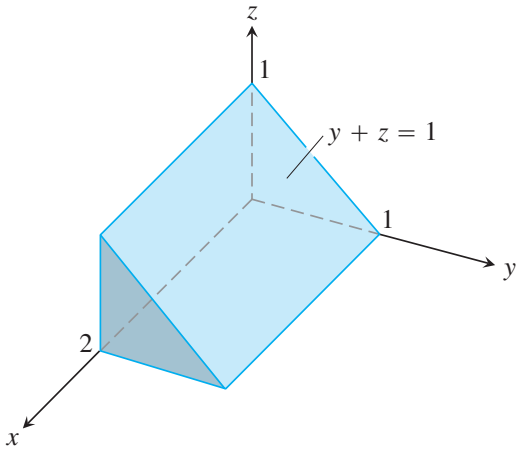

Figure 1: Prism.

Sol. There are six different iterated triple integrals for the volume of this prism. Here, we evaluate the volume using the integral $\int_0^1 \int_0^{1-z} \int_0^2 dxdydz$. We have

$$\text{volume} = \int_0^1 \int_0^{1-z} \int_0^2 dxdydz = \int_0^1 \int_0^{1-z} \Big[x\Big]\Big|_0^2 dydz = 2\int_0^1 \int_0^{1-z} dydz$$
$$= 2\int_0^1 \Big[y\Big]\Big|_0^{1-z} dz = 2\int_0^1 (1-z)dz = \Big[2z - z^2\Big]\Big|_0^1 = 2 - 1 = 1 \text{ unit}^3.$$

"Life isnt about finding yourself. Life is about creating yourself. " ∼ George Bernard Shaw