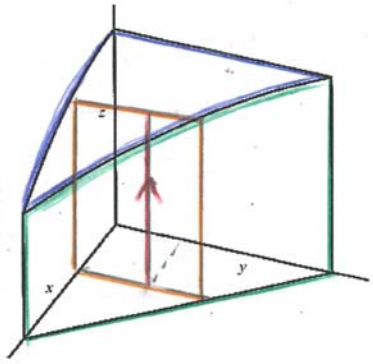
Raymond Lai
Mon 3/23/2020 9:15 AM

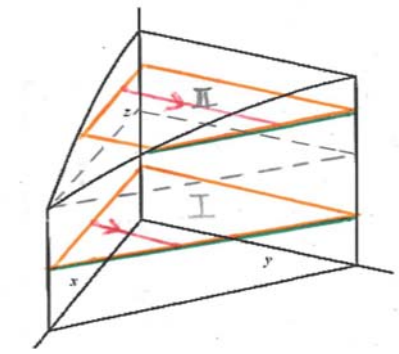
Hi Jeff,

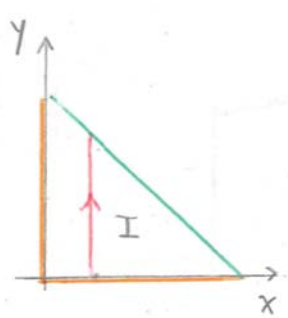
The limits of integration depend on the order of integration as well as the geometry.

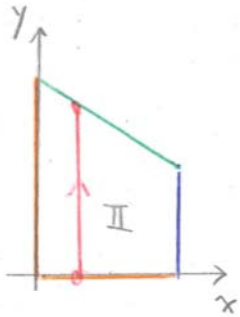
The first integral we did on the work sheet uses the order of integration dz-dy-dx.
As x is the variable for the outermost integral, its limits of integration come from the smallest and largest values of this variable x among all the points in the region T; in particular, the upper limit of integration is 3 (the x-coordinate of the points on the line of integration of the plane y = 3 - x and the yz-plane).



In #2.4.3, the order of integration is dy-dx-dz. As x is the variable of integration for the integral one level in from the outermost integral with dz, the limits of integration for this variable are the smallest and largest values of x among all the points on the surface of intersection of T with the plane z = generic constant (alternatively, a plane parallel to the xy-plane); from the geometry, if 0 < z < 5, the upper limit of integration for x would be x = 2 (from points on the line of intersection of the plane y = 2 - x and the xz-plane); if 5 < z < 9, the upper limit of integration for x would be x = sqrt(9 - z) (from the points on the surface z = 25 - x^2).







Please also see the first example in this section 2.4 (on page 56).

--Raymond

From: Jeff Chapman <
Sent: Sunday, March 22, 2020 3:16 PM
To: Raymond Lai <Lai@camosun.bc.ca>
Subject: 2.4.3

hello Raymond.
question 2.4.3 seems very similar to the worksheet we did in class. Im confused as to why we used 0 to 3-x in class for the bounds on the first integral with respect to x, but the answer for this question uses 0 to 2, the x intercept as apposed to the equation of the line.

Hope that made sense.
Thanks

-Jeff