MAT2500-03/04 09S Quiz 7 Print Name (Last, First) _____|__

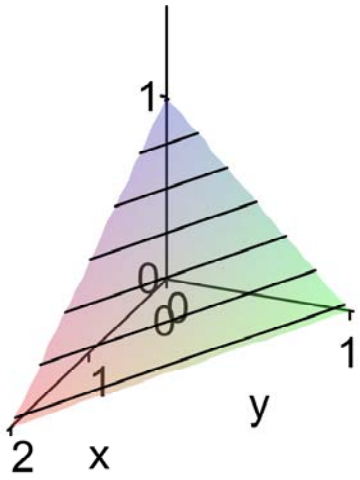
Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use arrows and equal signs when appropriate. Always simplify expressions. BOX final short answers. LABEL parts of problem. Keep answers EXACT (but give decimal approximations for interpretation when appropriate). Indicate where technology is used and what type (Maple, GC).

1. Consider the integral $\int_0^3 \int_0^{\frac{y}{3}} f(x, y)\ dx\ dy$.

a) Make a diagram in the plane shading in the region of integration, and showing a typical cross-section with its directional arrow indicating the inner integration, labeling its endpoints properly. [Label axes, tickmarks, intercepts, etc.]

b) Now make a similar new diagram indicating the corresponding situation for the reversed order of integration, showing the typical cross-section with properly labeled endpoints.

c) Write down the new iterated double integral and evaluate it for $f(x, y) = 1$ using technology (state which technology is used) to get the area (value = 3/2) of the region. Do you get the correct result? If not, can you track down your error in setup?




2. Consider an integral over the region near the origin of the first octant cut off by the plane $\frac{x}{2} + y + z = 1$ shown in the figure.

a) To iterate a triple integral $\iiint f(x, y, z)\ dy\ d..\ d..$ integrating first in the $y$ direction, what are the starting and stopping values of $y$ for the back wall and front wall looking down the $y$ axis: $y = ?..?$.

b) Make a 2-dimensional labeled diagram for the remaining two variables for the outer double integral, choosing one of the two possible orders for that iteration, showing clearly by labeling endpoints the starting and stopping values of the first integration and the range of values for the second variable, as in problem 1.

c) Now write down the iterated triple integral and integrate the function $f(x, y, z) = 1$ to get the volume of this solid region (value = 1/3). Do you get the correct result? If not, can you track down your error in setup?

## ► solution