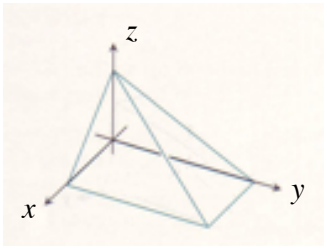
Quiz #9

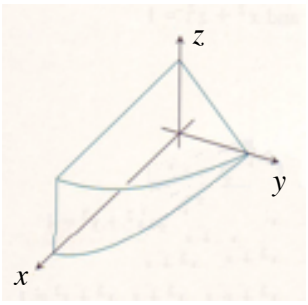
1. In this problem you will always be concerned with the region in the first octant that is bounded by:

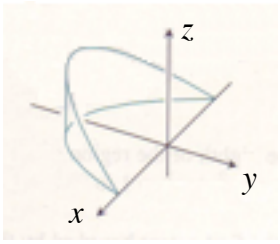
- $x = 0$
- $y = 0$
- $z = 0$
- $y + z = 2$
- $x = 4 - y^2$.

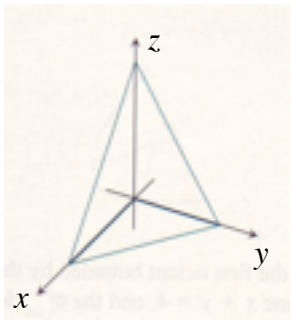
You should not use your calculator to evaluate integrals in this problem, apart from working out arithmetic and evaluating functions.

(a) **(1 point)** Which of the follow diagrams shows the region described above? **CIRCLE YOUR ANSWER.** If you circle more than one answer, you will receive zero credit.









(b) **(2 points)** Set up a **double** integral that will give the volume of the region described above.

(c) **(2 points)** Calculate the volume of the region described above. Show all of your work. If you give your answer as a decimal, include at least four (4) decimal places.

Additional space for your work is provided on the next page.

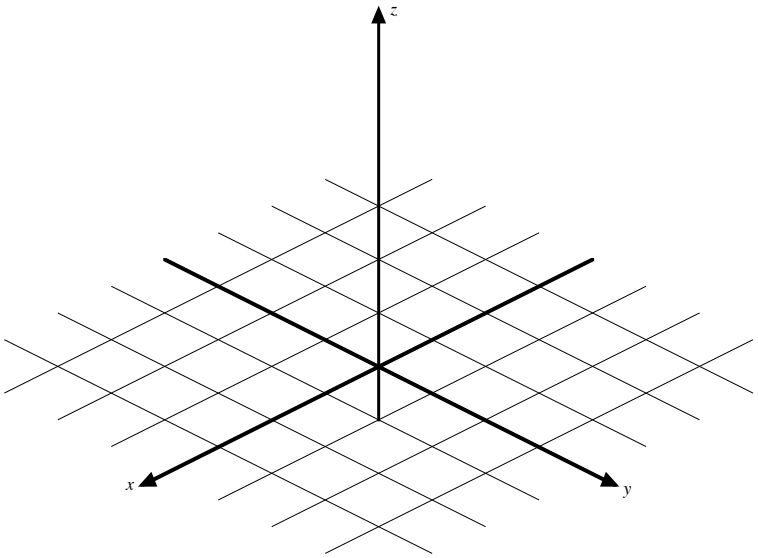
In this problem you will always be concerned with the region in the first octant that is bounded by:

- $x = 0$
- $y = 0$
- $z = 0$
- $y + z = 2$
- $x = 4 - y^2$.

You should not use your calculator to evaluate integrals in this problem, apart from working out arithmetic and evaluating functions.

If you give your answer as a decimal, include at least four (4) decimal places.

2. **(a)** **(1 point)** The surface S is the part of the paraboloid $z = x^2 + y^2$ that lies inside the cylinder $x^2 + y^2 = 4$. Use the axes provided below to make an accurate sketch of the surface S.



(b) **(3 points)** Set up a **TRIPLE** integral in x, y, z coordinates that will give the volume enclosed by the surface S, the cylinder $x^2 + y^2 = 4$ and the plane $z = 0$. You **do not** need to evaluate this integral.

3. **(1 point)** Evaluate the following triple integral:

$$\int_0^1 \int_0^z \int_0^{x+z} 6 \cdot x \cdot z \cdot dy \cdot dx \cdot dz .$$

Show all of your work and clearly indicate your final answer. NO WORK = NO CREDIT.

You should **not use a calculator** in this part of the problem for anything besides arithmetic.

If you give your final answer as a decimal, include at least four (4) decimal places.