

V63.0123-1 : Calculus III. Homework 8

due Wed Apr 2 at lecture.

16.3: (reminder of re-expressing D in two ways)

35.

38.

16.6: (surface area using double integral)

4. Sketch D and be clear about whether you treat as Type I or II.

10. Later you will see how this result comes easily from spherical coords.

21.

16.7: (triple integrals in Cartesian coords)

2. Please choose the following 3 orderings: $dx dy dz$, then $dz dy dx$, finally $dy dx dz$. Make sure your answers agree!

8. [You may want to sketch the 'shadow' of the domain on the xy plane and on the xz plane].

14.

32. Although seemingly tedious, this question is actually great practise for triple integrals. Sketch the domain in 3d, and it's shadow onto the xy , yz and xz planes. Please list your answers in the order: $dz dx dy$, $dx dy dz$, $dx dz dy$, $dy dx dz$, $dy dz dx$. [See Problem 29 for hints].

46. [The average value is analogous to 2d, and is given above. In doing the middle integral you will expand out lots of terms, most of which cancel. $V(E)$ for a pyramid is a known formula so you can check your answer for it.]

16.8: (triple integrals in cylindrical, spherical coords)

1.

3.

10.

18.

24. You may recognize this volume as the first picture on the Syllabus!