

HW 7
Math 261, F17

Please see the course syllabus for details on how to turn in your homework assignments. This one is due at the beginning of your class on **Friday, October 27**.

1. Set up but do **NOT** evaluate a double integral to compute the integral of $f(x, y) = \cos(xy)$ over the part of the unit disk (the region inside the circle of radius 1 centered at the origin) in the first quadrant (where $x > 0$, $y > 0$). **USE** the variable order $dx dy$.
2. Convert the following double integral to an equivalent polar form but do **NOT** evaluate:

$$\int_0^1 \int_y^{\sqrt{4-y^2}} x^2 + y^2 dx dy$$

3. Set up but do **NOT** evaluate a triple integral to compute the volume of the tetrahedron with vertices $(0, 0, 0)$, $(1, 0, 0)$, $(0, 2, 0)$, and $(0, 0, 1)$. The top plane of the tetrahedron is given by $2x + y + 2z = 2$. **USE** the order $dz dy dx$.
4. Consider the tetrahedron T with vertices $(1, 0, 0)$, $(1, -1, 1)$, $(1, 1, 1)$, and $(0, 0, 1)$. How many regions must T be split into in order to integrate some function over T with the following variable orders (each worth 1 point)? (Each answer is just 1 number!)
 - (a) $dx dy dz$
 - (b) $dx dz dy$
 - (c) $dy dz dx$

(It would be good practice to try setting these integrals up, but that's not required for the problem.)