

1. Rewrite the below integral as an equivalent iterated integral in more than two other orders.

$$\int_0^1 \int_0^{1-x^2} \int_0^{1-x} f(x, y, z) dy dz dx$$

2. Write the equation in spherical coordinates.

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

3. Sketch the solid whose volume is given by the integral and evaluate the integral.

$$\int_0^{2\pi} \int_{\frac{\pi}{2}}^{\pi} \int_1^2 \rho^2 \sin \phi d\rho d\phi d\theta$$

4. Evaluate  $\iiint_E y^2 dV$ , where  $E$  is the solid hemisphere  $x^2 + y^2 + z^2 \leq 9, y \geq 0$ .

5. Evaluate  $\iiint_H (9 - x^2 - y^2) dV$ , where  $H$  is the solid hemisphere  $x^2 + y^2 + z^2 \leq 9, z \geq 0$ .

### Jacobian of a transformation

Definition?

6. Find the Jacobian of the transformation.

a)  $x = uv, y = u/v$

b)  $x = e^{s+t}, y = e^{s-t}$

Course Homework due Apr 9, Wed.

Mar 31, Mon. : **15.9** 5, 6, 7, 9, 11, 17, 21, 23, 25

Apr 2, Wed. : **15.10** 1, 3, 5, 7, 9, 11, 12, 13

Apr 4, Fri. : **15.10** 15, 17(a), 19, 21, 23, 24