1. Evaluate the integral $\iiint_E (xy+z^2)dV$, where $E=[0,2]\times[0,1]\times[0,3]$.

2. Evaluate the iterated integral $\int_0^2\int_0^{z^2}\int_0^{y-z}(2x-y)\,dx\,dy\,dz$

3. Express the integral $\iiint_E f(x,y,z)dV$ as an iterated integral in six different ways, where E is the solid bounded by the surfaces $y=x^2$, $z=0$, $y+2z=4$.

4. Evaluate the triple integral
   (a) $\iiint_E e^{z/y}dV$, where $E=\{(x,y,z): 0\le y\le 1, y\le x\le 1, 0\le z\le xy\}$
   (b) $\iiint_E 6xy\,dV$, where E lies under the plane $z=1+x+y$ and above the region in the xy-plane bounded by the curves $y=\sqrt{x}$, $y=0$, and $x=1$.
   (c) $\iiint_E x\,dV$, where E is bounded by a paraboloid $x=4y^2+4z^2$ and the plane $x=4$.
   (d) $\iiint_E z\,dV$, where E is bounded by the cylinder $y^2+z^2=9$ and the planes $x=0$, $y=3x$, and $z=0$ in the first octant.

5. Use a triple integral to find the volume of the region bounded by the parabolic cylinders $z=x^2$, $z=2-x^2$ and by the planes $y=0$, $y+z=4$.

6. Write the equation $x^2+y^2+z^2=4y$ in cylindrical and spherical coordinates.

7. Convert the integral
$$\int_0^1\int_0^{\sqrt{1-y^2}}\int_{x^2+y^2}^{\sqrt{x^2+y^2}} xyz\,dz\,dx\,dy$$
   to an integral in cylindrical coordinates, but don't evaluate it.

8. Convert the integral
$$\int_0^3\int_0^{\sqrt{9-y^2}}\int_0^{\sqrt{9-x^2-y^2}}(x^2+y^2+z^2)\,dz\,dx\,dy$$
   to an integral in spherical coordinates, but don't evaluate it.

9. Use cylindrical and spherical coordinates to find the volume of the ice-cream cone bounded above by the sphere $x^2+y^2+z^2=5$ and below by the cone $z=2\sqrt{x^2+y^2}$.

10. Let E be the solid region bounded below by the cone $z^2=x^2+y^2$, $z\ge 0$ and above by the plane $z=4$. Set up the integral for computing the mass of the solid if the density is $\rho(x,y,z)=xyz$ in
    (a) cylindrical coordinates
    (b) spherical coordinates