**Problem 1:** Compute the volume of the solid $E$ enclosed by $x = y^2$, $x = 0$, $y = -1$, $y = 1$, $z = 0$ and $z = 30x + 15y + 15$.

**Problem 2:**

Calculate the following integral

$$
\iiint_{E} e^x (y + 2z) \, dV,
$$

where $E$ is the solid bounded by the planes $z = 0$, $z = x + y$, $y = 0$, $y = x$ and $x = 1$.

**Problem 3:**

1. Calculate the following integral

$$
\iiint_{E} \sqrt{x^2 + y^2} \, dV,
$$

where $E$ is the region inside the cylinder $x^2 + y^2 = 4$ and inside the sphere $x^2 + y^2 + z^2 = 16$.

2. Calculate the integral

$$
\iiint_{E} \sqrt{x^2 + y^2 + z^2} \, dV,
$$

where $E$ is the same region as previously.

**Problem 4:** Find the volume of the solid enclosed by the surface $z^2 = x^2 + y^2$ and the surface $x^2 + y^2 + z^2 = 2$. 
Problem 5: Calculate the following integrals

1. \[
\int_{y=-2}^{2} \int_{x=-\sqrt{4-y^2}}^{\sqrt{4-y^2}} \int_{z=-\sqrt{x^2+y^2}}^{\sqrt{x^2+y^2}} xydzdx dy.
\]

2. \[
\int_{x=0}^{1} \int_{y=0}^{\sqrt{1-x^2}} \int_{z=0}^{\sqrt{\sqrt{2-x^2-y^2}}} xydzdydx.
\]

3. \[
\int_{x=-2}^{2} \int_{y=-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_{z=2-\sqrt{4-x^2-y^2}}^{2+\sqrt{4-x^2-y^2}} (x^2 + y^2 + z^2)^{3/2} dzdydx.
\]

4. \[
\int_{y=0}^{2} \int_{x=-\sqrt{4-y^2}}^{\sqrt{4-y^2}} x^2 + 2y^2 dx dy.
\]

5. \[
\int_{y=0}^{2} \int_{x=y^2}^{1} y^3 e^{x^3} dx dy.
\]

6. \[
\int_{y=-2}^{2} \int_{x=0}^{\sqrt{4-y^2}} \int_{z=-\sqrt{4-x^2-y^2}}^{\sqrt{4-x^2-y^2}} y^2(x^2 + y^2 + z^2)^{3/2} dzdydx.
\]