1. Find the volume below the surface $z = 1 + x + y$ and above the region R in the xy-plane bounded by the graphs $x = 1, y = 0, y = x^2$.

2. Find the volume below the surface $z = \cos(x^2)$ and above the triangle R in the xy-plane bounded by the x-axis, the line $x = 1$, and the line $y = x$.

3. Evaluate $\displaystyle\int_0^{\pi} \int_x^{\pi} \frac{\sin(y)}{y}\, dy\, dx$ by reversing the order of integration.

4. Evaluate $\displaystyle\iint_R 2x - y\, dA$ where R is the upper half of the circle with center at the origin and radius 2.

Evaluate each integral

1. $\displaystyle\int_0^1 \int_{x^2}^1 x^3 \sin(y^3)\, dy\, dx$

2. $\displaystyle\int_0^1 \int_{\sqrt{y}}^1 \sqrt{x^3+1}\, dx\, dy$

3. $\displaystyle\int_0^1 \int_0^1 \sin(e^x)\, dx\, dy \quad + \quad \int_1^e \int_{\ln(y)}^1 \sin(e^x)\, dx\, dy$

4. $\displaystyle\int_0^{2\pi} \int_{15}^{38} e^{-4y^2} \sin(x)\, dy\, dx$