(Double integral)

0. Given $D = \{[x, y] \in \mathbb{R}^2 : 1 \leq y \leq x^2 \wedge (0) \leq x \leq 2\}$,
   compute volume of a body form above domain D under the graph of function $f(x, y) = 3 + \frac{x}{y^2}$.

Triple integrals

1. Given a body: $M = \{[x, y, z] \in \mathbb{R}^3 : 0 \leq x \wedge 0 \leq y \leq x \wedge 0 \leq z \leq 3 - x - y\}$.
   Its density $\rho(x, y, z) = 3$.

   (a) Determine the upper x-boundary and sketch the projection to xy plane.

   (b) Compute its mass.

2. Given a body bounded by: planes $y = 2x$; $x = 0$; $y = 2$
   and inequality $2 - y \leq z \leq 3$.
   Sketch the projection to xy plane and compute its volume.

3. Given a body in the first octant, bounded by: $x + y = 1$; $z = xy$.
   Sketch the projection to xy plane and compute its volume.

4. Sketch (in cuts) a cylindrical reservoire with radius $R = 2$, symmetrical about z-axes which is
   bounded by planes $z = 0$ and $z = -3 - x$. Compute its volume.

5. Sketch (in cuts) a body $M = \{[x, y, z] \in \mathbb{R}^3 : 0 \leq z \leq 4 - x^2 - y^2 \wedge y \geq 0\}$.
   Compute its volume.