## **EXERCISES 10.1** (submit by 19.06.2015)

- 1. Find  $\lim_{y\to 0} \int_{-1}^{1} \sqrt{x^2 + y^2} dx$ .
- 2. Let  $I(y) = \int_0^1 \arctan \frac{x}{y} dx$ . Prove that I(y) is continuous for y > 0. Find I'(y) for y > 0.
- 3. Let  $I(y) = \int_0^1 \frac{2xy^2}{(x^2+y^2)^2} dx$ . Is I(y) continuous at 0?
- 4. Let  $F(x) = \int_0^x \frac{\ln(1+xy)}{y} dy$ . Find F'(x) for x > 0.