

## Exercises: Line Integral by Length

**Problem 1.** Let  $C$  be the curve from point  $p(0,0)$  to point  $q(1,1)$  on the parabola  $y = x^2$ . Calculate  $\int_C x \, ds$ .

**Problem 2.** Let  $C$  be the line segment from point  $p(1,2,3)$  to point  $q(8,7,6)$ . Calculate  $\int_C x+z^2 \, ds$ .

**Problem 3.** Let  $C$  be the circle  $x^2 + y^2 = 1$ . Calculate  $\int_C y \, ds$ .

**Problem 4.** Let  $C$  be the intersection of two surfaces: sphere  $x^2 + y^2 + z^2 = 3$  and plane  $x = y$ . Calculate  $\int_C x^2 \, ds$ .