

**Sheet 8.**

**Problem 1.** Exercise 3.2.1.

**Problem 2.** Exercise 3.3.1.

**Problem 3.** Exercise 3.3.2.

**Problem 4.** Let  $d \in \mathbb{N}$ . Show that there exists  $\Phi \in \mathbf{N}$  such that  $\mathcal{D}(\Phi) = (d, 2d, 1)$  and such that for all  $x \in \mathbb{R}^d$  it holds that  $(\mathcal{R}_a(\Phi))(x) = \|x\|_1 = |x_1| + |x_2| + \dots + |x_d|$  where  $a$  is the rectifier activation function.