

# Worksheet

1/8/2020

1. Let  $V$  be the set of all continuous functions from  $[0, 1]$  to  $\mathbb{R}$  that vanish at 1. In other words,

$$V = \{f : [0, 1] \rightarrow \mathbb{R} \text{ continuous, } f(1) = 0\}.$$

The addition and scaling are the natural addition and scaling of functions. Show that  $V$  is a vector space over  $F = \mathbb{R}$  by checking all the vector space axioms:

- Check (A0)

- Check (A1)

*see Lecture 3*

- Check (A2)

- Check (A3)

- Check (A4)

- Check (S0)

- Check (S1)

- Check (S2)

- Check (D1)

- Check (D2)

2. Let  $V = \mathbb{R}$  with the usual addition and scaling. Show that  $V$  is not a vector space over  $\mathbb{C}$ .

*see Lecture 3*