

1. Find all real numbers  $t$  for which the set  $S = \{ (t, 1, 1), (1, t, 1), (1, 1, t) \}$  is linearly independent.

2. Decide if the set  $S = \{ (1, 0, 0, 1), (0, 2, 0, 2), (1, 0, 1, 0), (0, 2, 2, 0) \}$  is a basis for  $\mathbb{R}^4$ . Explain your reasoning.