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4. Consider  $f : \mathbb{R}^3 \rightarrow \mathbb{R}$  given by  $f((x_1, x_2, x_3)) = 2x_2 - x_3$ . Prove that this is a linear transformation.

5. Prove that  $\{(1, 1), (0, 1)\}$  is a basis of  $\mathbb{R}^2$ .