Skriftlig innlevering 3

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C.2

The invertible matrix theorem says that if an $n \times n$ matrix $\mathbf{A}$ is invertible then the columns of the $\mathbf{A}$ span $\mathbb{R}^n$, that is the column space of $\mathbf{A}$ is $\mathbb{R}^n$. The theorem also says that the columns of $\mathbf{A}$ are linearly independent, which means that the columns form a basis for $\mathbb{R}^n$ if and only if $\mathbf{A}$ is invertible which is true if and only if the determinant of $\mathbf{A}$ is non zero.

C.3

$$f(x) = a_0 + a_1x + a_2x^2 \Rightarrow f(0) = a_0$$

$$f(0) = 0 \Rightarrow a_0 = 0$$

$$W = \left\{f : \mathbb{R} \to \mathbb{C} \mid f(x) = a_0 + a_1x + a_2x^2, x \in \mathbb{R}, a_0 = 0, a_1, a_2 \in \mathbb{C}\right\}$$

$$f(x) = a_1x + a_2x^2$$

$$f(10) = 10a_1 + 100a_2 = 0$$

$$a_1 = -10a_2$$

$$Y = \left\{f : \mathbb{R} \to \mathbb{C} \mid f(x) = a_0 + a_1x + a_2x^2, x \in \mathbb{R}, a_2 \in \mathbb{C}, a_1 = -10a_2, a_0 = 0\right\}$$