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Homework 3 supplement: Fundamentals of Mathematics (Math 320) Stevenson

Let P_2 be the set of all polynomials with coefficients in \mathbf{R} and in variable x of degree less than or equal to 2. That is,

$$P_2 = \{f(x) = a_0 + a_1x + a_2x^2 \mid a_0, a_1, a_2 \in \mathbf{R}\}.$$

For example, $h(x) = (x - 1)(x - 2) = 2 - 3x + x^2 \in P_2$. Consider the following two subsets of P_2 :

$$A = \{f(x) \in P_2 \mid \exists a \in \mathbf{R} \text{ s.t. } f(x) = a(x - 2)^2\}.$$

$$B = \{f(x) \in P_2 \mid f(2) = 0\}$$

1. Prove that $A \subset B$.
2. Is $B \subset A$? Prove your assertion.