

Do problems 2, 6, 7, and 13 from Section 6.2.

The following problem refers to Theorem 6.1.5 of the text.

A. Let f be the polynomial $f(x) = 2x^3 + 5x^2 - x + 1$. We know f is differentiable at each point c in \mathbb{R} , so for each c in \mathbb{R} , there is a Carathéodory function φ which is continuous at c and satisfies $\varphi(c) = f'(c)$. That is, for each c in \mathbb{R} , there is φ which is a function of x , but depends on c . We often call functions of one variable that depend on another a function of two variables: Find the polynomial $g(x, c)$ so that for each c in \mathbb{R} , $g(x, c) = \varphi(x)$, where φ is the Carathéodory function for f at the point c .