Multiple-Choice Test

Chapter 05.01
Background on Interpolation

1. The number of polynomials that can go through two fixed data points (x_1, y_1) and (x_2, y_2) is
   (A) 0
   (B) 1
   (C) 2
   (D) infinite

2. A unique polynomial of degree _____ passes through $n+1$ data points.
   (A) $n+1$
   (B) $n+1$ or less
   (C) n
   (D) n or less

3. The following function(s) can be used for interpolation:
   (A) polynomial
   (B) exponential
   (C) trigonometric
   (D) all of the above

4. Polynomials are the most commonly used functions for interpolation because they are easy to
   (A) evaluate
   (B) differentiate
   (C) integrate
   (D) evaluate, differentiate and integrate

5. Given $n+1$ data points $(x_0, y_0), (x_1, y_1), ..., (x_{n-1}, y_{n-1}), (x_n, y_n)$, assume you pass a function $f(x)$ through all the data points. If now the value of the function $f(x)$ is required to be found outside the range of the given x-data, the procedure is called
   (A) extrapolation
   (B) interpolation
   (C) guessing
   (D) regression

6. Given three data points (1,6), (3,28), and (10, 231), it is found that the function $y = 2x^2 + 3x + 1$ passes through the three data points. Your estimate of y at $x = 2$ is most nearly

(A) 6
(B) 15
(C) 17
(D) 28

Complete Solution