Quiz 1 (16-09-2018)

Math 371, Introduction to Numerical Computing

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Question 1. **[2 marks]** Let $f(x) = \sin(x)$ and $x_0 = 1$. Determine

(a) [1 mark] The first-degree Taylor polynomial at $x = 1.01$.

(b) [1 mark] Error upper bound at $x = 1.01$.

Question 2. [2 marks]

(a) [1 mark] Determine the three significant digit (a) *rounding towards zero* and (b) *rounding to the nearest* values of the real number 2.857143×10^{20}. Write the final approximations in *scientific notation format*.

(b) [1 mark] Suppose that $\text{fl}(x)$ is the 10-digit rounding approximation of a real number x, then what is the relative error upper bound in this approximation?