1. (5 points) Evaluate the limit, if it exists.

\[ \lim_{{t \to 0}} \left( \frac{1}{\sqrt[3]{1+t}} - \frac{1}{t} \right) \]

\[ \lim_{{t \to 0}} \left( \frac{1}{t} \left( \frac{1}{3} \frac{1}{\sqrt[3]{1+t}} - \frac{1}{t} \right) \right) = \lim_{{t \to 0}} \frac{1}{t} \left( \frac{1}{3} \frac{1}{1+t} - \frac{1}{t} \right) = \lim_{{t \to 0}} \frac{1}{t} \left( \frac{1}{3} \frac{1}{1+t} + \frac{1}{t} \right) = \frac{1}{3} \]

2. (5 points) Show that there is a root of the equation

\[ 4x^3 - 6x^2 + 3x - 2 = 0 \]

between 1 and 2.

Consider \( h(x) = 4x^3 - 6x^2 + 3x - 2 \)

\[ h(1) = 4 - 6 + 3 - 2 = -1 < 0 \]

\[ h(2) = 32 - 24 + 6 - 2 = 12 > 0 \]

by the intermediate value theorem. \( h(x) \) is continuous on \([1, 2]\).