For full credit please fully simplify your answers.

Problem 1

Consider the function $f(x) = 4x^3 - 3x^2 - \frac{5}{8}$ on the interval $x \in [0, 1]$.

1. *Find the maximum of the function on this domain.*

2. *Find the minimum of the function on this domain.*

3. *Does this function have a root x_0 where $f(x_0) = 0$ on this domain? Justify your answer.*

Problem 2

Find the limit and rates of convergence of the following function as $h \to 0$:

$$f(h) = e^{h^2} + 2\cos(h)$$