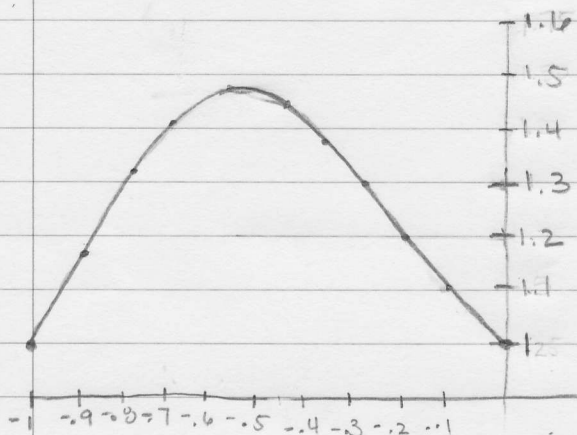


pg. 276 #52, Presentation problem

$$f(x) = e^{x^3-x}, \quad -1 \leq x \leq 0$$

- a. use a graph to estimate the absolute maximum & minimum values of the function to two decimal places.



- absolute
- the maximum by the graph looks to be about $(-0.47, 1.47)$.
 - there is no ^{absolute} minimum for this graph.

- b. use calculus to find the exact maximum & minimum values.

$$f(x) = e^{x^3-x}$$

$$f'(x) = e^{x^3-x} (3x^2-1)$$

$$f'(x) = (3x^2-1)(e^{x^3-x})$$

$$f'(x) = 0$$

$$3x^2-1=0$$

$$3x^2=1$$

$$x^2 = \frac{1}{3}$$

$$x = \pm \sqrt{\frac{1}{3}}$$

since $x = +\sqrt{\frac{1}{3}}$ is not in the interval that was given it is not needed.

to find the exact value of for the max, you just plug in $x = -\sqrt{\frac{1}{3}}$ into the original function.

$$f(x) = e^{(\frac{1}{3})^{3/2} - (\frac{1}{3})^{1/2}} \quad (\text{maximum value})$$