

#11 | $f(x) = \frac{1}{x} + \ln x$, $\frac{1}{2} \leq x \leq 4$

Endpoints:

$f(\frac{1}{2}) = 2 + \ln \frac{1}{2} \approx 1.307 \leftarrow \text{local max}$

$f(4) = \frac{1}{4} + \ln 4 \approx 1.636 \leftarrow \text{Abs. Max}$

Critical #s:

$f(1) = 1 + \ln 1 = 1 \leftarrow \text{Abs. Min}$

$f(0) = \text{undefined}$

$f(x) = x^{-1} + \ln x$

$f'(x) = -x^{-2} + \frac{1}{x}$

$= -\frac{1}{x^2} + \frac{1}{x}$

$f'(x) = \frac{-1+x}{x^2}$

$f' = \text{zero}$

$-1+x=0$
 $x=1$

$f' \text{ und}$

$x^2=0$

$x=0$

#12 | $f(x) = e^{-x}$, $-1 \leq x \leq 1$

Endpts:

$f(-1) = e \leftarrow \text{Abs Max}$

$f(1) = e^{-1} = \frac{1}{e} \leftarrow \text{Abs Min}$

Crit #s:

none

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

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

$f'(x)$ is never equal to zero & never und.
Therefore no critical #s.

Even Answers

#14: Max of 1 at $x=0$

#16: Local min of 1 at $x=0$; local max of -1 at $x=\pi$

#18: Max of $3^{3/5}$ at $x=3$