1a. REL MAX @ $x=2$

$f'(x)$ CHANGES FROM POS TO NEG.

1b. $f'(x)$ DOES NOT HAVE A REL. MIN

THE ABS MIN MUST OCCUR AT AN ENDPOINT

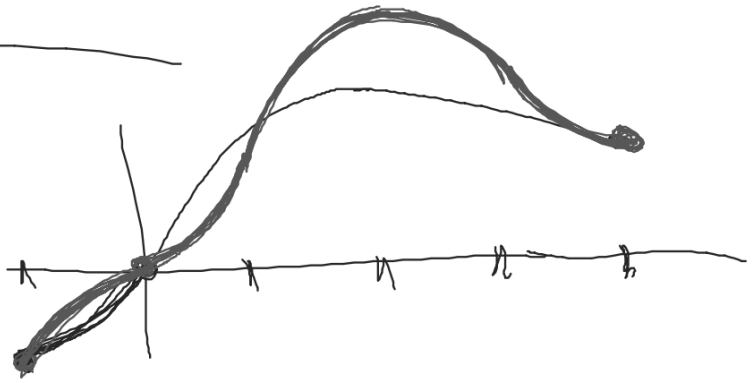
$f(-1)=-1$ AND $f(4)=1$

ABS MIN @ $x=-1$

1c. $(-1, 0) \cup (1, 3)$

1d. $x = 0, x = 1, \& x = 3$

1e.



(17) $\lim_{x \to 0^+} \frac{\ln x}{x} = \frac{-\infty}{0} \simeq \frac{-\infty}{\text{small}} = -\infty$

(13) $\lim_{x \to 0} \frac{\tan px}{\tan qx} = \frac{0}{0}$

$\overset{H}{=} \lim_{x \to 0} \frac{p \sec^2 px}{q \sec^2 qx} = \frac{p}{q}$

1

1

(25) $\lim_{t \to 0} \frac{5^t - 3^t}{t} = \frac{0}{0}$

$\overset{H}{=} \lim_{t \to 0} \frac{5^t \cdot \ln 5 - 3^t \ln 3}{1} = \ln 5 - \ln 3$

$= \ln 5/3$

$\frac{x^7}{x^2}$

(33) $\lim_{x\to 1} \dfrac{1-x+\ln x}{1+\cos \pi x} = \dfrac{1-1+0}{1+-1} = \dfrac{0}{0}$

$\overset{H}{=} \lim_{x\to 1} \dfrac{-1+\frac{1}{x}}{(\pi)(-\sin \pi x)} \quad x^{-1} = \dfrac{-1+1}{\pi(-\sin \pi)} = \dfrac{0}{0}$

$\overset{H}{=} \lim_{x\to 1} \dfrac{-1x^{-2}}{-\pi \cos(\pi x)\cdot \pi} = \dfrac{-1}{-\pi^2(-1)} = \boxed{\dfrac{-1}{\pi^2}}$