Homework 2-2

① Analyzing the graph
pretty simple

② Analyzing the graph,
just note that
oscillating limit is DNE

③ $f(x)=\begin{cases} 13 & x<-1 \\ -x+12 & -1\le x<8 \\ 0 & x=8 \\ 5 & x>8 \end{cases}$

$\lim_{x\to 8^-} f(x)=4$

$\lim_{x\to 8^+} f(x)=5$

$\lim_{x\to 8} f(x)=\text{DNE}$

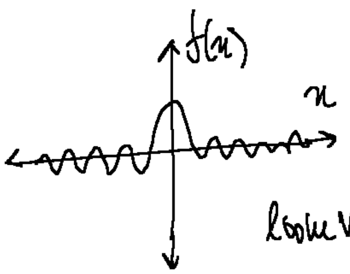
$\lim_{x\to -1^-} f(x)=13$

$\lim_{x\to -1^+} f(x)=13$

$\lim_{x\to -1} f(x)=13$

④ $\lim_{\theta\to 0} \frac{\sin(4\theta)}{\theta}=4$

Used the graph
as the question suggest



zoom very close

⑤ $\lim_{x\to 0} \frac{e^x-1-x}{x^2}$

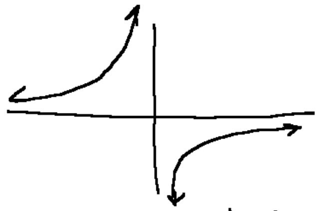
approximation values

$f(0.001)=0.5001$

$f(-0.001)=0.49983$

Avg approx $\approx \boxed{\frac{1}{2}}$

⑥ $\lim_{x\to \frac{5}{6}^+} \frac{23x}{5-6x}$ = Analyze graph



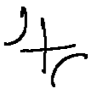
then $\lim_{x\to \frac{5}{6}^+} f(x)=\infty$ & $\lim_{x\to \frac{5}{6}^-} f(x)=\infty$

⑦ know the standard graphs:

ⓐ $\lim_{x\to 8^+} \frac{2}{x-8}=\infty$ 

ⓑ $\lim_{x\to 5} \frac{2}{(x-5)^6}=\infty$ 

ⓒ $\lim_{x\to -7^-} \frac{1}{x^2(x+7)}=-\infty$ 

ⓓ $\lim_{x\to 5^-} \frac{2}{(x-5)^3}=-\infty$ 

⑧ $\lim_{x\to 0} \frac{x-1}{x^3+2x^2}$; $x^2(x+2)\neq 0$

$x^2=0$; $x=-2$

Vertical Asymptote = -2 & $\boxed{\text{Om2}}$

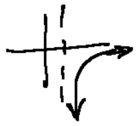
then 

HW2-2 Continued:

(9) $m = \dfrac{m_0}{\sqrt{1-\frac{v^2}{c^2}}}$, then

$\lim_{v \to c^-} m(x) = \infty$ $\because$

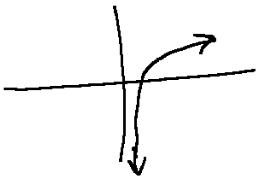
$f(x) = \dfrac{1}{\sqrt{x}} =$ 

$f(x) = \dfrac{1}{\sqrt{1-x}} =$ 

similar to $m(x)$
then limit is infinity

(10) $\lim_{x \to 7^+} \ln(x-7) = -\infty$

graph of $\ln(x)$



Very similar to this