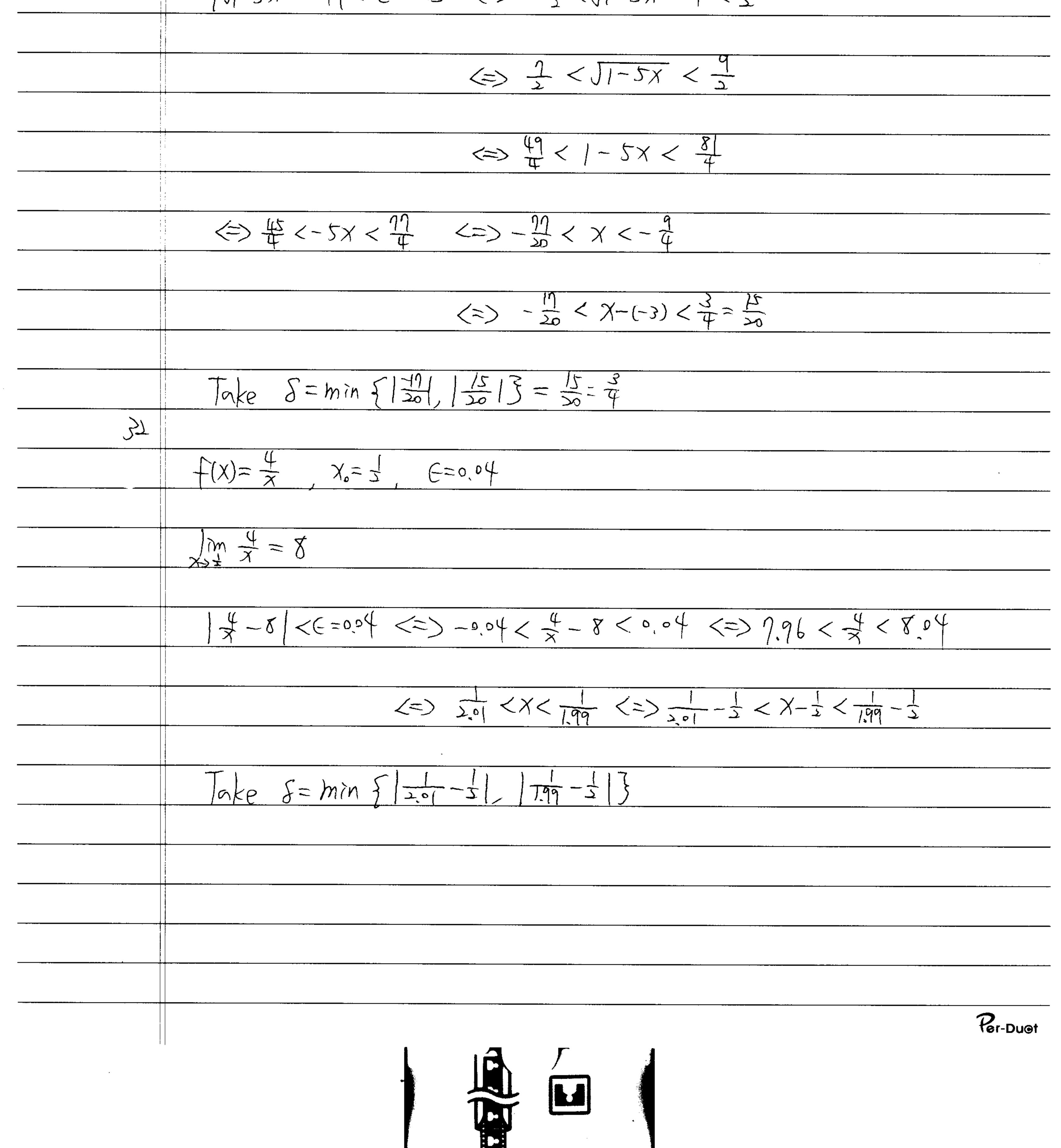
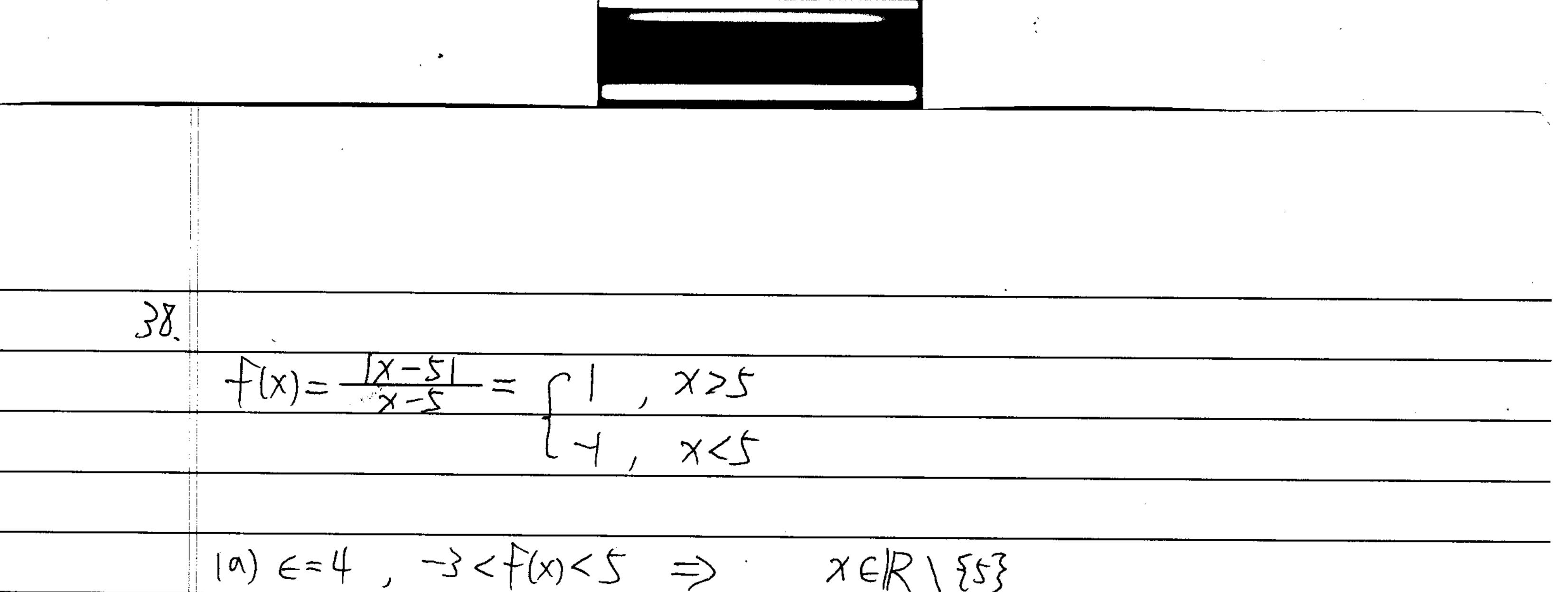
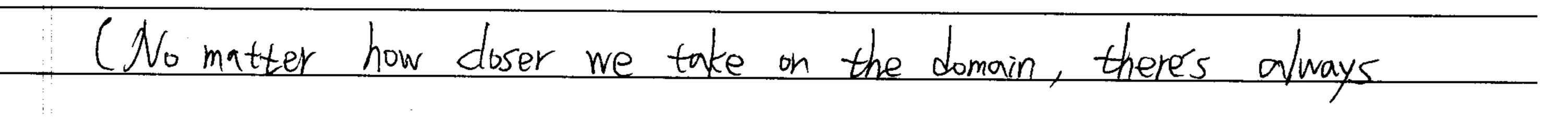
$$\frac{1}{1-2x} - \frac{1}{4} < \frac{1-2x}{4} - \frac{1}{4} < \frac{1-2x}{4} - \frac{1}{4} < \frac{1}{4}$$





(b) E=2,  $-|\langle F(X) \langle 3 \rangle => \chi >5$  $(c) \in =1$ , o < f(x) < 2 => x > 5(d)  $\in = \pm, \quad \pm < f(x) < \pm \implies x > 5$ Let  $f(x) = c \sin x$ ,  $x \neq \frac{\pi}{2}$   $(x = \frac{\pi}{2})$ Consider the point  $X=\tilde{\Sigma}$ , f(x) increases to 1 as  $X \rightarrow \tilde{\Xi}^{\dagger}$  $\delta \qquad \chi \longrightarrow \overline{\Xi}$ So F(x) gets closer to 2, but  $\lim_{x \to \infty} F(x) = 1$ Since given  $E > 0, \forall S > 0 = \chi \in (\frac{\pi}{2} - \delta, \frac{\pi}{2} + \delta)$ Such that 1f(x)-21>1

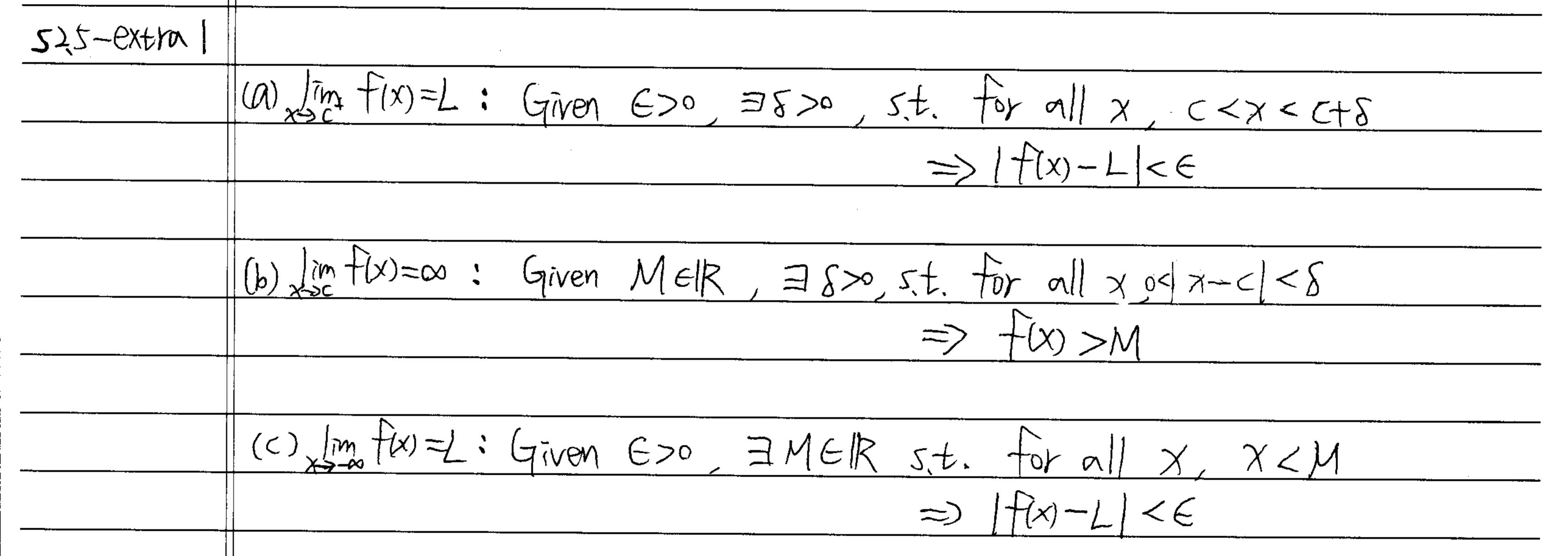


## a distance between $\lim_{x \to \mp} f(x) \& f(\underline{F})$



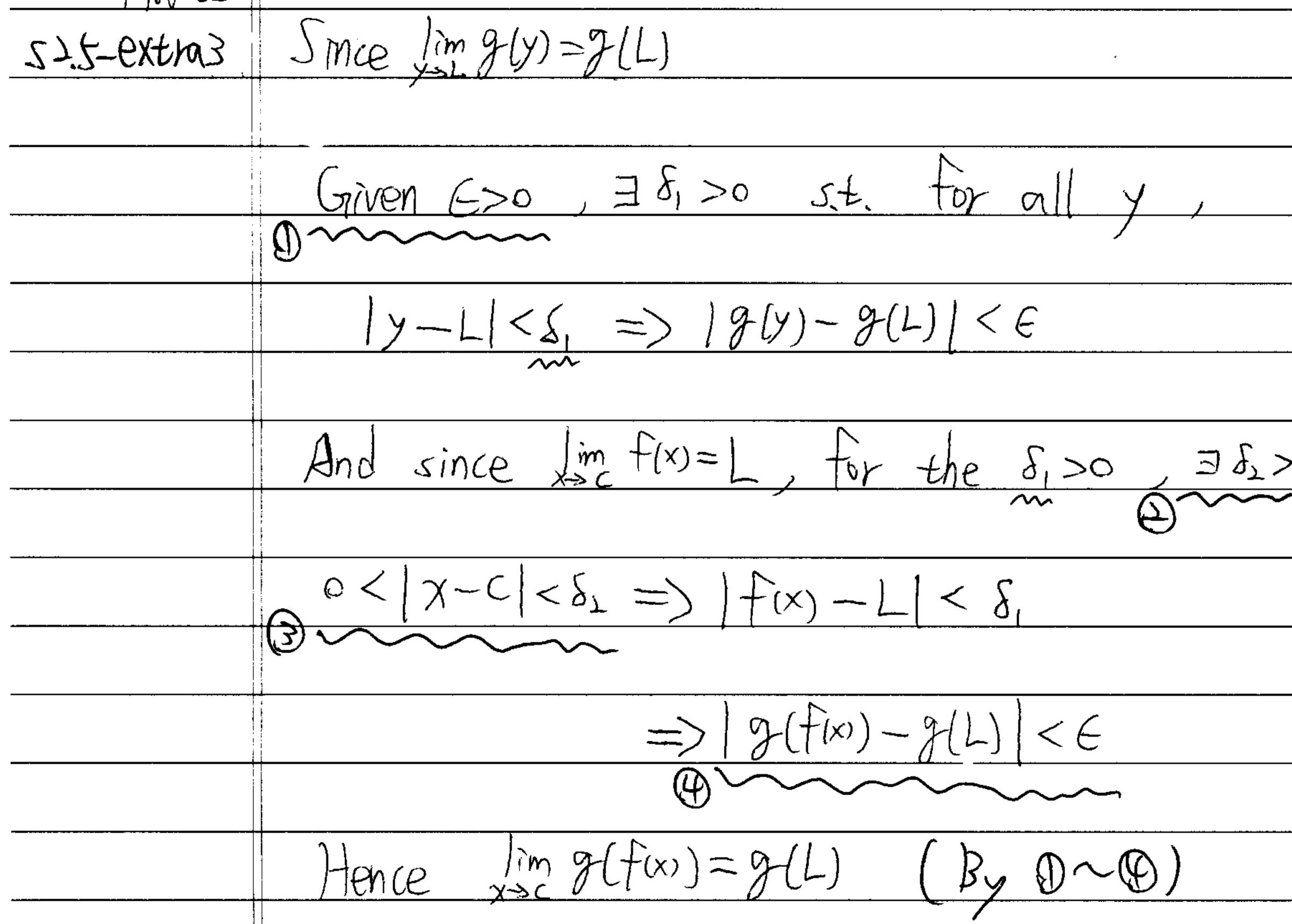
 $\frac{1}{2} \frac{1}{2} \frac{1}$  $||x|-o| < E \implies |x| < E \implies |x-o| < E$ So, given E > 0, we take S = Ethen for all x, if 1x-01<s => [f(x)-0]  $\|f(x) = 5x - 10, x_0 = 3, E = 0.05$  $\lim_{x \to 3} 5x - 10 = 5$ 15x-10 -5 1 <0.05 <=> -0.05 < 5x-15 < 0.05 (=) 14.95 < 5X < 15.05<=> 2.99 < X < 3.0 <=>We take 2 =0.01

$=   x  - 0  =  x  < \delta = E$	
	<u></u>
$-9.0  < \chi - 3 < 0.0 $	
·	
	<u> </u>



s], 5-extm2	IF fix and g(x)
	=> Given E>0,
	take $\delta = min^{2}$
	$\Rightarrow$ ] fix + 26
	$\leq   F(x)  $
	2. 1 Fin-2
	$\leq  fx $
	Hence both fix

are both continuous at  $\chi = C$ ∃ 8, 20 s.t. for all x o<|x-c|<8,=>|f(x)-f(c)|< € ∃δ,>0 5.t. for all x, o< |x-c|<δ1 ⇒ |g(x)-g(c)|< € {8,,8], then for all x, o</x-c/<8 [x] - (f(c) + g(c)) = [(f(x) - f(c)) + (g(x) - g(c))] $-f(c) + |g(x) - g(c)| < \epsilon$ f(x) - (f(c) - g(c)) = [(f(x) - f(c)) - (g(x) - g(c))]-f(c) | + |g(x) - g(c)| < E)tgas & the gas are continuous at 1=c



>0	s.t.	for	<u>all</u>	$\overline{\chi}$
	· · · · · · · · · · ·			

t: (o, 1) -> R be defined as sis-extral Let if x= #, 1,2 GN, (1,2)= f(x) = otherwise discontinuous at XE(0;1) NQ 25 PF: XE(0,1)∩R => X= ₽, for some 1,2E, f(x) = +and hence For E, 0< E< = , ¥8>0, JYE(0,1)Q such that  $|f(x) - f(y)| = \neq > \in$ => + is discontinuous at x (()continuous at ZELO, 1)Q ÌS P1: If  $\chi \in (0,1) \setminus Q \implies f(x) = 0$ Given E>O, J PENSE. J<E pick S=mi then if  $|y-x| < \delta => f(y) < \Rightarrow \Rightarrow |f(x) - f(y)| < \Rightarrow => f(y) < \Rightarrow \Rightarrow |f(x) - f(y)| < \Rightarrow => f(y) < \Rightarrow \Rightarrow |f(x) - f(y)| < \Rightarrow => f(y) < \Rightarrow \Rightarrow |f(x) - f(y)| < \Rightarrow \Rightarrow |f(y)| < \Rightarrow$ Hence f'is continuous at X

W, (P, 2) = 1
and $Y \in \beta(X, \delta)$
$\sum_{x \to 1} \int  x - \frac{1}{x}   x - \frac{1}{x} $
$in \left[  x-\pm ,  $
1) < E