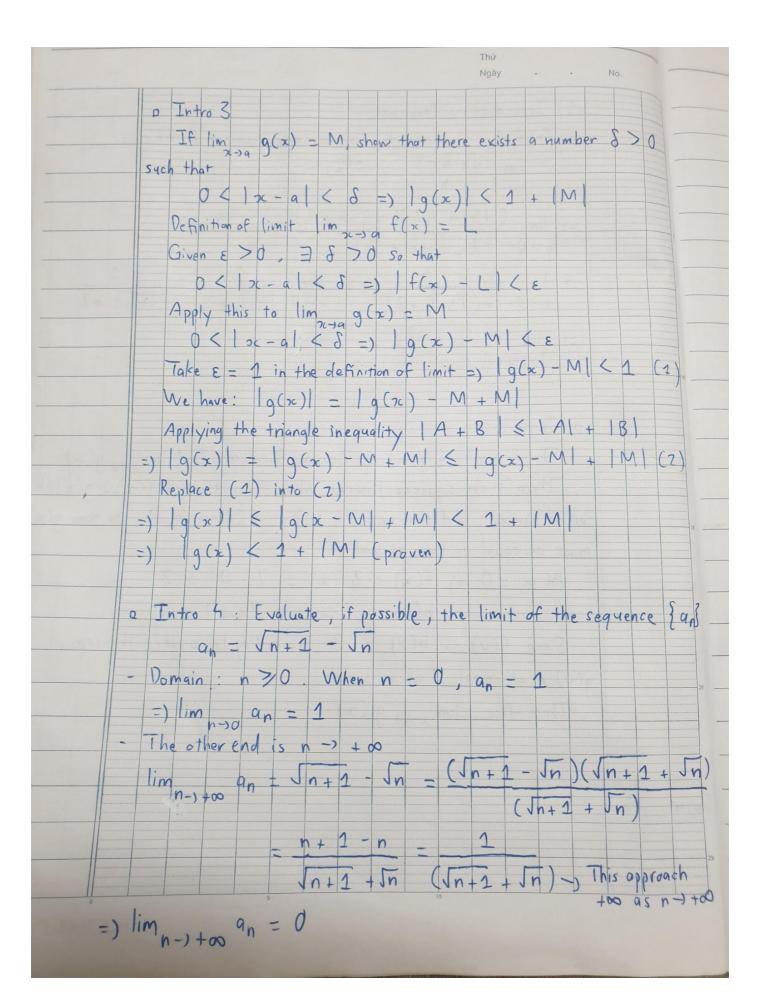
The same of the sa	Introductory Problems  Intro 1: Evaluate the limit or explain why it doesn't exist  lim J4+h-2 - f(1/x)  h>0 h
***************************************	$h \to 0$ $h(Jh+h+2)$
	) $\lim_{h\to 0} \frac{h+h-5}{h+h+2} = \lim_{h\to 0} \frac{1}{\sqrt{5+h+2}} = \frac{1}{\sqrt{5+h+2}}$ E) $\lim_{h\to 0} \frac{f(h)}{h-2} = \frac{1}{\sqrt{5+h+2}} = \frac{1}{\sqrt{5+h+2}}$
	Intro 2: If $z - x^2 \le g(x) \le 2\cos x$ for all $x$ , find $\lim_{x \to 0} g(x)$ There is the squeeze theorem which states that if $f(x) \le g(x) \le h(x)$
	all numbers, and there exists a so that $f(a) = h(a)$ , so then $g(a)$ ust be equal to them as well  At $x = 0 = 1$ , $f(x) = 2 + x^2 = 2 - 0^2 = 2$ $= 1$
9(	Since $f(0) = h(0) = 2$ , according to squeeze theorem,  (a) must equal 2 as well  There fore, $\lim_{x\to 0} g(x) = 2$

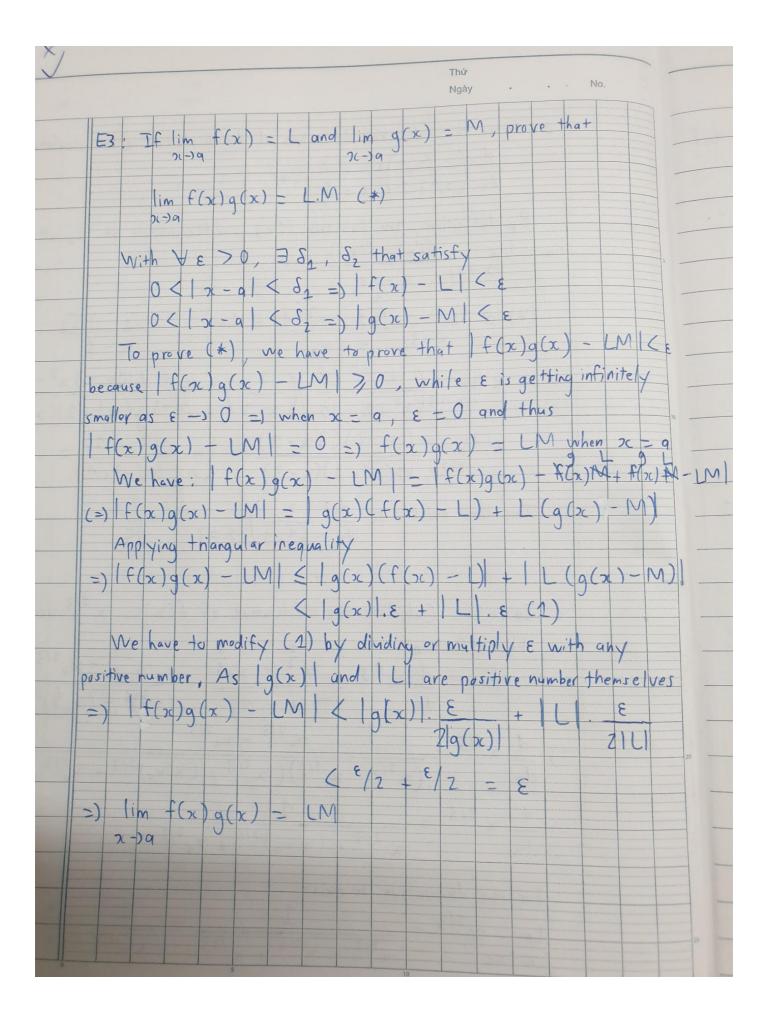


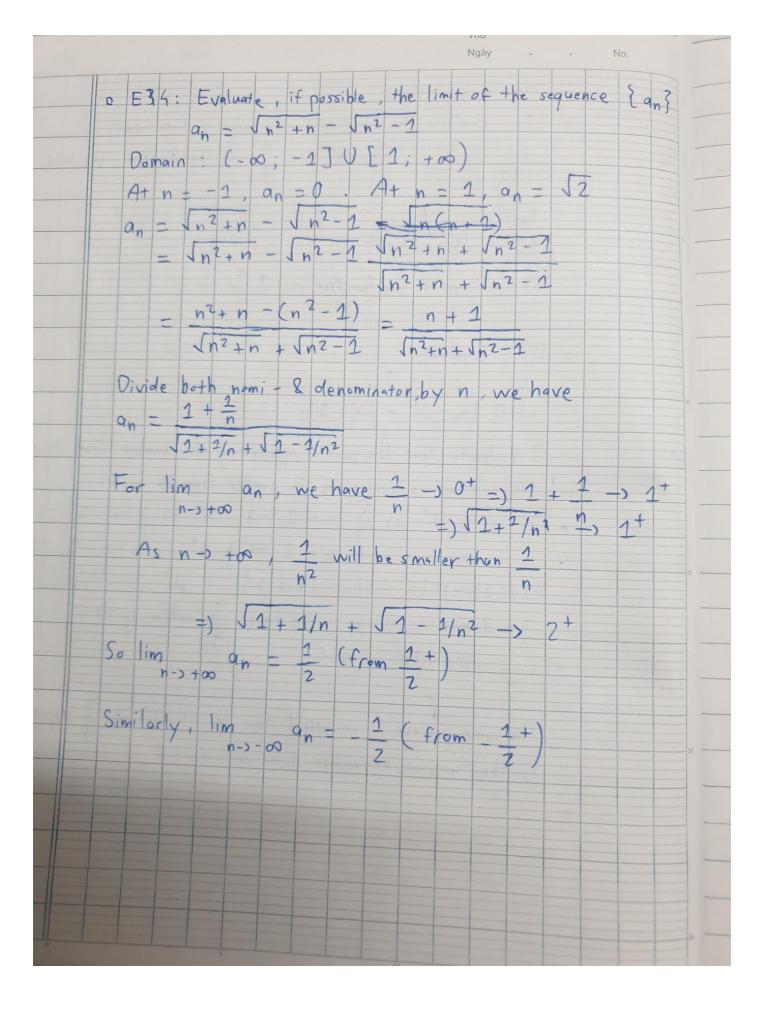
D Intro 5: Use the definition of derati derivative to calculate 0  $\frac{d}{dx}\left(\frac{x}{x^2+1}\right) = 3 \quad (*)$ By definition, the function f(x) is differentiable at  $x_0$  if the limit  $\lim_{x\to x_0} \frac{f(x)-f(x_0)}{x-x_0}$  exists  $(*) - \lim_{x \to 3} \frac{x^2 + 1}{x^2 + 1} - \lim_{x \to 3} \frac{x^2 + 1}{x^2 + 1} - \lim_{x \to 3} \frac{x^2 + 1}{x^2 + 1} = \lim_{x \to 3} \frac{x^2 + 1}{x$  $= \lim_{x \to 3} \left( \frac{x}{x^2 + 1} \right) \left( \frac{1}{x - 3} \right) = \lim_{x \to 3} \left( \frac{10x - 3x^2 - 3}{x^2 + 1} \right) \left( \frac{1}{x - 3} \right)$   $= \lim_{x \to 3} \left( \frac{x^2 + 1}{x^2 + 1} \right) \left( \frac{3x - 1}{x - 3} \right) = \lim_{x \to 3} \left( \frac{3x - 1}{x^2 + 1} \right) = \frac{2}{25}$ This limit exists, so  $\frac{d}{dx} \left( \frac{x}{x^2 + 1} \right) = \frac{2}{7.5}$ 2 Intro 6: Calculate the derivative of f(x) = >c 2/3 using only the definition

only the definition  $\frac{1}{3} - \frac{1}{3} - \frac{1}{3} - \frac{1}{3} - \frac{1}{3} - \frac{1}{3} - \frac{1}{3}$ We have:  $\frac{1}{3} - \frac{1}{3} -$ 3 For the derivative to exist  $\lim_{x \to \infty} 2^{13} = \frac{1}{2^{13}} = \frac{1}{3} =$ 

KOKUYO

Thứ Ngày • No.
2) Homework Problems
B E2: Evaluate  lim $1 - 1 - 1 \times 1$ I'll clenote that the plus is approaching the number from its right and the subtract is approaching the number from its eft $1 \times 1 \times$





Ngày e E5: How should the function g(x) = x2 sonx be defined on x = 0 so that it is continuous there? Is it then differentiable there To prove that a function is continuous at oc = 200 we have to prove that  $\lim_{x \to \infty} f(x) = \lim_{x \to \infty} f(x_0) = f(x_0)$ We have:  $\int_{0}^{2\pi} \frac{1}{2\pi} dx = 0$ =)  $g(x) = x^{2} sgn(x) = 0$ Note have:  $\lim_{x \to 0} g(x) = -0^{2} = 0$ Note have:  $\lim_{x \to 0} g(x) = -0^{2} = 0$ 2. Differentiability: g(0) = 0Differentiability: Differentiability:  $\lim_{x \to 0^{\pm}} g(x) - g(0) = g(x)$ We have  $\lim_{x \to 0^{+}} g(x) - x^{2} = x = 0$   $\lim_{x \to 0^{+}} g(x) - x^{2} = x = 0$   $\lim_{x \to 0^{-}} \chi - \chi = \chi = 0$   $\lim_{x \to 0^{-}} \chi - \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} g(x) = \chi = \chi = 0$   $\lim_{x \to 0^{-}} \chi - \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} g(x) = \chi = \chi = 0$   $\lim_{x \to 0^{-}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} g(x) = \chi = \chi = 0$   $\lim_{x \to 0^{-}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} g(x) = \chi = \chi = 0$   $\lim_{x \to 0^{-}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} \chi = \chi = 0$   $\lim_{x \to 0^{+}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} \chi = \chi = 0$   $\lim_{x \to 0^{+}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} \chi = \chi = 0$   $\lim_{x \to 0^{+}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} \chi = \chi = 0$   $\lim_{x \to 0^{+}} \chi = \chi = 0$ So  $\lim_{x \to 0^{+}} \chi = \chi = 0$ 

n E6. Calculate the derivative of  $f(x) = x^{2/n}$  where n is a positive integer using the definition

of  $f(x) = \frac{24n}{x} = \frac{1}{x} = \frac$  $\frac{1}{2} \frac{1}{n} + \frac{1}{2} \frac{1}{n}$