nama: wira suuma saputra Nim: 2021080075

kelas: TINFC 01

No

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Pertemuan 6

no. 1 carilah limit berikut

a.) $\lim_{x\to\infty} \frac{x}{x-5}$

b. $\lim_{x\to\infty} \frac{x^2}{5-x^3}$

c $\lim_{x\to\infty} \frac{x^3}{2x^3-100x^2}$

d $\lim_{x\to\infty} \frac{3\sqrt{x^3+3x}}{\sqrt{2x^3}}$

e $\lim_{n\to\infty} \frac{n}{2n+1}$

f $\lim_{x\to\infty} \frac{\sqrt{x+1}}{x+4}$

jawab:

a. $\lim_{x\to\infty} \frac{x}{x-5} = \lim_{x\to\infty} \frac{\frac{x}{x}}{\frac{x}{x}-\frac{5}{x}}$

$= \lim_{x\to\infty} \frac{1}{1-\frac{5}{x}} = \frac{1}{1-0} = \frac{1}{1} = 1$

b $\lim_{x\to\infty} \frac{x^2}{5-x^3} = \lim_{x\to\infty} \frac{\frac{x^2}{x3}}{\frac{5}{x^3}-\frac{x^3}{x^3}} = \lim_{x\to\infty} \frac{\frac{1}{x}}{\frac{5}{x^3}-1}$

$= \frac{0}{0-1}$

$= \frac{0}{-1}$

$= 0$

c. $\lim_{x\to\infty} \frac{x^3}{2x^3-100x^2} = \lim_{x\to\infty} \frac{\frac{x^3}{x^3}}{\frac{2x^3}{x^3}-\frac{100x^2}{x^3}} = \lim_{x\to\infty} \frac{1}{2-\frac{100}{x}}$

$= \frac{1}{2-0} = \frac{1}{2}$

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Nim: 20210810075
kelas: TINFC-01

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d. $\lim_{x \to \infty} \frac{3\sqrt{x^3} + 3x}{\sqrt{2x^3}} = \lim_{x \to \infty} \frac{3\sqrt{x^3} + 3x}{\sqrt{2} \cdot \sqrt{x^3}}$

$= \lim_{x \to \infty} \frac{\frac{3\sqrt{x^3}}{\sqrt{x^3}} + \frac{3x}{\sqrt{x^3}}}{\sqrt{2} \cdot \frac{\sqrt{x^3}}{\sqrt{x^3}}}$

$= \lim_{x \to \infty} 3 + \frac{3x}{x^{1/2}}$

$= \frac{3+0}{\sqrt{2}} = \frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$

e $\lim_{n \to \infty} \frac{n}{2n+1} = \lim_{n \to \infty} \frac{\frac{n}{n}}{\frac{2n}{n} + \frac{1}{n}} = \lim_{n \to \infty} \frac{1}{2 + \frac{1}{n}}$

$= \frac{1}{2+0} = \frac{1}{2}$

F $\lim_{x \to \infty} \frac{\sqrt{x+1}}{x+4} = \lim_{x \to \infty} \frac{\frac{\sqrt{x}}{x} + \frac{1}{x}}{\frac{x}{x} + \frac{4}{x}}$

$= \lim_{x \to \infty} \frac{\frac{\sqrt{x}}{x} + \frac{1}{x}}{1 + \frac{4}{x}}$

$\frac{0+0}{1-0}$

$= \frac{0}{1}$

$= 0$

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NIM : 2021 08 100 75

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no 2 carilah nilai limit berikut

a $\lim_{n\to\infty} \frac{n}{\sqrt{n^2+1}}$

b $\lim_{n\to\infty} \frac{n^2}{\sqrt{n^3+2n+1}}$

c $\lim_{n\to 4^+} \frac{x}{x-4}$

d $\lim_{t\to 3^+} \frac{t^2-9}{t-3}$

e $\lim_{t\to 3} \frac{t^2}{9-t^2}$

f $\lim_{x\to 3} \frac{x^2-x-6}{x-3}$

g $\lim_{x\to 2^+} \frac{x^2-2x-8}{x^2-4}$

Jawab

a. $\lim_{n\to\infty} \frac{n}{\sqrt{n^2+1}} = \lim_{n\to\infty} \frac{\frac{n}{n}}{\frac{\sqrt{n^2}}{n}+\frac{1}{n}}$

$= \lim_{n\to\infty} \frac{1}{1+\frac{1}{n}} = \frac{1}{1+0} = 1$

b. $\lim_{n\to\infty} \frac{n^2}{\sqrt{n^3+2n+1}} = \lim_{n\to\infty} \frac{\frac{n^2}{n^2}}{\frac{\sqrt{n^3}+2n}{n^3}+\frac{1}{n^3}}$

$= \frac{1}{\sqrt{1+0+0}} = \frac{1}{\sqrt{1}}$

c $\lim_{x\to 4^+} \frac{x}{x-4} = \lim_{x\to 4^+} \frac{\frac{x}{x}}{\frac{x}{x}-\frac{4}{x}} = \lim_{x\to 4^+} \frac{1}{1-\frac{4}{x}} = \frac{4}{4-0}$

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NIM : 2021086007S
Kelas : TINFC-01

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d. $\lim_{t \to 3^+} \frac{t^2-9}{t-3} = \lim_{t \to 3^+} \frac{\frac{t^2}{t^2} - \frac{9}{t^2}}{\frac{t}{t^2} - \frac{3}{t^2}}$

$= \lim_{t \to 3^+} \frac{1 - \frac{9}{t^2}}{\frac{1}{t} - \frac{3}{t^2}}$

$= \frac{1-0}{0-0} = 1 \frac{3}{0} = \infty$

e. $\lim_{t \to 3} \frac{t^2}{9 \cdot t^2} = \lim_{t \to 3} \frac{\frac{t^2}{t^2}}{\frac{9}{t^2} - \frac{t^2}{t^2}}$

$= \lim_{t \to 3} \frac{1}{\frac{9}{t^2} - 1}$

$= \frac{1}{0-1} = \frac{-3}{0-(-3)} = \frac{-3}{3}$

$= -1$

f. $\lim_{x \to 3^-} \frac{x^2-x-6}{x-3} = \lim_{x \to 3^-} \frac{\frac{x^2}{x^2} - \frac{x}{x^2} - \frac{6}{x^2}}{\frac{x}{x^2} - \frac{3}{x^2}}$

$= \lim_{x \to 3} \frac{1 - \frac{1}{x} - \frac{6}{x^2}}{\frac{1}{x} - \frac{3}{x^2}} = \frac{1-0-0}{0-0}$

$= \frac{3}{0} = \infty$

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nim : 2021081007
kelas : TINFC 01

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g $\lim_{x \to 2^+} \frac{x^2 - 2x - 8}{x^2 - 4} = \lim_{x \to 2^+} \frac{\frac{x^2}{x^2} + \frac{2x}{x^2} - \frac{8}{x^2}}{\frac{x^2}{x^2} - \frac{4}{x^2}}$

$= \lim_{x \to 2^+} \frac{1 + \frac{2}{x} - \frac{8}{x^2}}{1 - \frac{4}{x^2}}$

$= \frac{1+0-0}{1-0}$

$= \frac{2+0-0}{1-0}$

$= \frac{2}{1} = 2$

no.3 carilah asimsot datar dan amsisof tegak dari fungsi berikut kemudian buatlah sketsa grafiknya

a $F(x) = \frac{3}{x+1}$

c $F(x) = \frac{3}{9-x^2}$

b $F(x) = \frac{2x}{x-3}$

jawab

a $F(x) = \frac{3}{x+1}$

→ tegak $= x + 1 = 0$

$x = -1$

→ datar $= F(x) \frac{3}{x+1}$

asimsut datar $y = 0$

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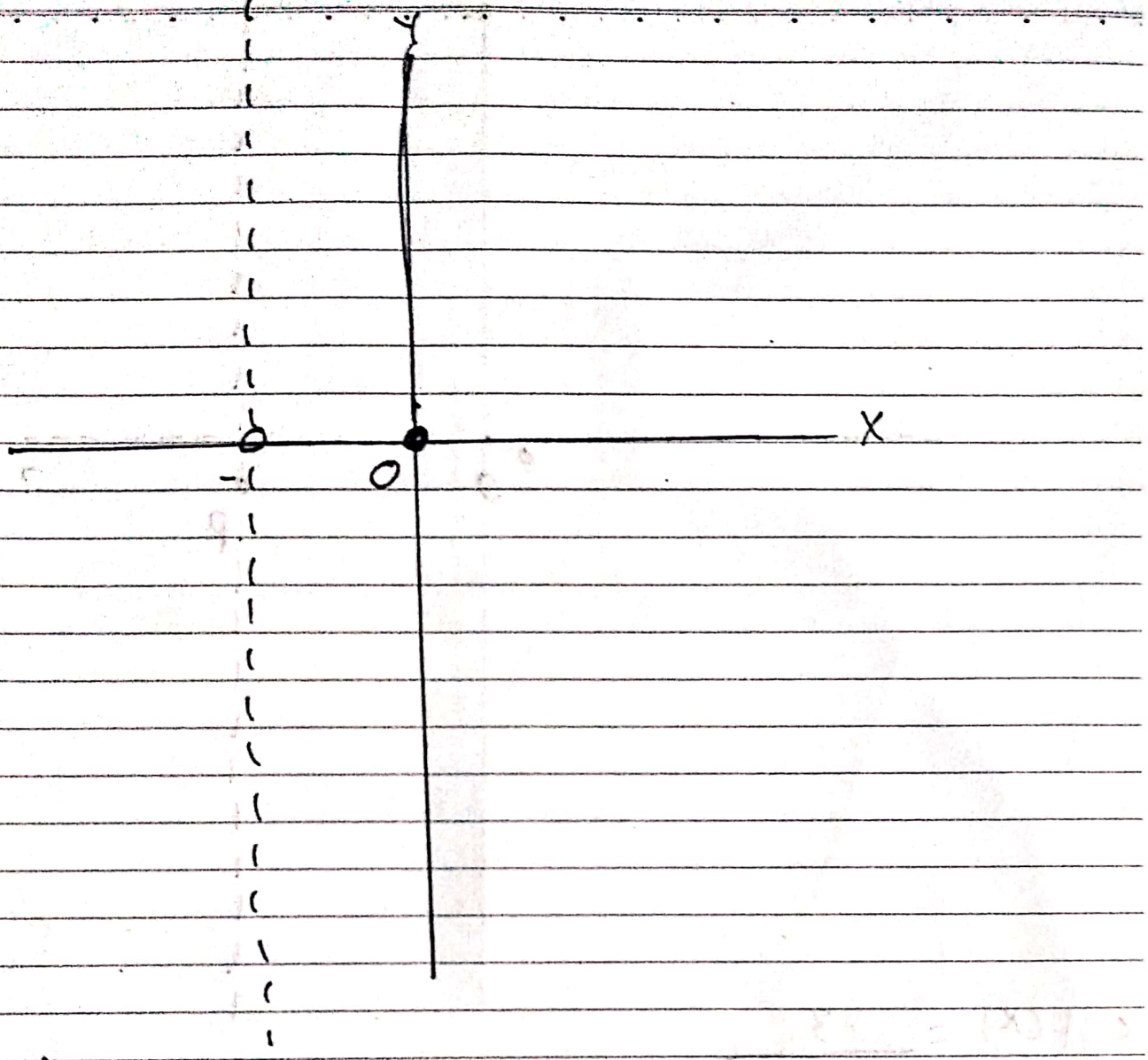
kelas : tinfc-01



b $F(x) = \frac{2x}{x-3}$

→ tegak = $x - 3 = 0$
$x = 3$

→ datar

$$\lim_{x \to \infty} \frac{2x}{x-3}$$

$$\lim_{x \to \infty} \frac{\frac{2x}{x}}{\frac{x}{x} - \frac{3}{x}}$$

$$\lim_{x \to \infty} \frac{2}{1-0} = \frac{2}{1} = 2 \quad y = 2$$

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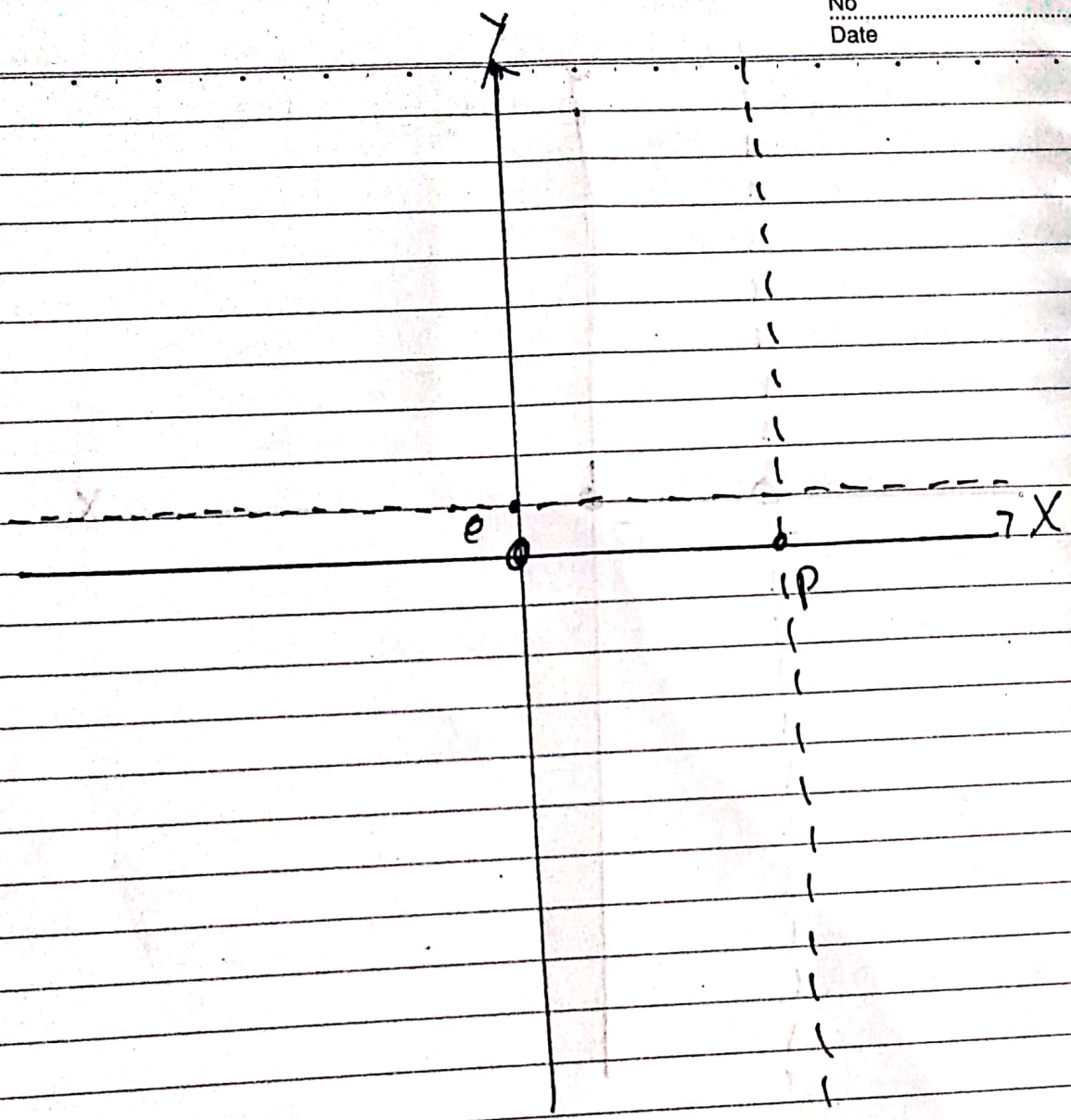
nim : 2021081100 75
kelas : TINF c - 01



$f(x) = \frac{3}{9-x^2}$

asimtot $\frac{3}{9-x^2}$, $x \neq 3$, $x \neq 3$

$\lim_{x \to 3} \left(\frac{3}{9-x^2} \right)$ = tidak ada

$\lim_{x \to 3} \left(\frac{3}{9-x^2} \right)$ = tidak ada

$x = -3$ mewakili asimtot

$x = 3$ —— " ——

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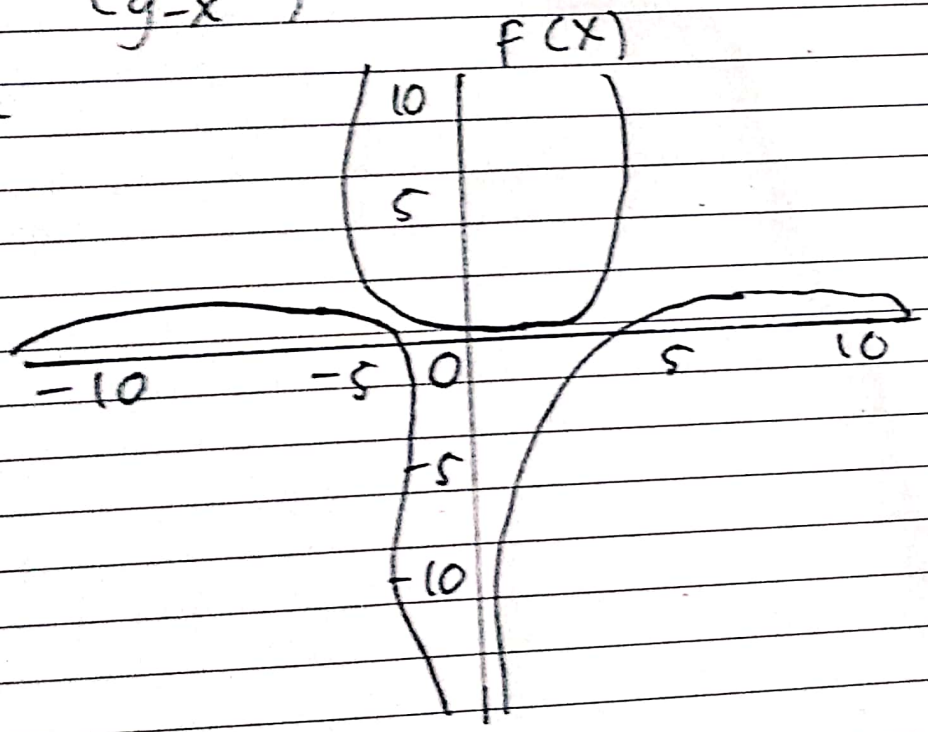
asim hur

$$\lim_{x \to \infty} \left(\frac{3}{9-x^2} \right) = 0$$

$$Y = 0$$

$$x \to -\infty \left(\frac{3}{9-x^2} \right) = 0$$

grafik



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