# Tugas Responsi Pertemuan 2 Kalkulus 2

#### Kelompok 7:

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1. Tentukan integral berikut  
a. 
$$\int_{3}^{\infty} \frac{x}{\sqrt{16+x^2}} dx$$
Jawab:

1.a 
$$\int_{3}^{\infty} \frac{x}{\sqrt{1b+x^{2}}} dx$$

$$= \lim_{b \to \infty} \int_{3}^{b} \frac{x}{\sqrt{1b+x^{2}}} dx$$

$$= \lim_{b \to \infty} \int_{3}^{b} \frac{x}{\sqrt{1b+x^{2}}} dx$$

$$= \lim_{b \to \infty} \int_{25}^{b} \frac{1}{2} U^{-1/2} dU$$

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$$= \lim_{b \to \infty} \int_{25}^{b} \frac{1}{25} U^{-1/2} dU$$
Divergen

b. 
$$\int_{-\infty}^{\infty} \frac{x}{\sqrt{9+x^2}} \ dx$$

Jawab

1. b. 
$$\int_{-\infty}^{\infty} \frac{x}{\sqrt{9+x^2}} dx$$

:  $\lim_{A \to -\infty} \int_{a}^{b} \frac{x}{\sqrt{9+x^2}} dx + \lim_{b \to \infty} \int_{b}^{b} \frac{x}{\sqrt{9+x^2}} dx$ 

misalkan  $g + x^2 : u$ 

$$\frac{du}{dx} : 2x$$

$$dx : \frac{du}{2x}$$
:  $\lim_{A \to -\infty} \int_{9+a^2}^{9} \frac{1}{2\sqrt{u}} du + \lim_{b \to \infty} \int_{a}^{9+b^2} \frac{1}{2\sqrt{u}} du$ 
:  $\lim_{A \to -\infty} \int_{9aa^2}^{9} \frac{1}{2^2} u^{-\frac{1}{2}} du + \lim_{b \to \infty} \int_{a}^{9+b^2} \frac{1}{2^2} u^{-\frac{1}{2}} du$ 
:  $\lim_{A \to -\infty} u^{\frac{1}{2}} = \int_{9+a^2}^{9+a^2} \frac{1}{2^2} u^{-\frac{1}{2}} du$ 
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### 2. Tentukan integral berikut

a. 
$$\int_{2}^{\infty} \frac{\ln \sqrt{x}}{x} dx$$
Jawab:

Jawab:

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Jawab:  $\int_{u}^{a} \ln \sqrt{u} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ =  $\lim_{n \to \infty} \int_{u}^{a} \ln (u)^{1/2} \, du$ Divergen

midalkan  $u = \ln u \rightarrow du = \frac{1}{u} du$ B.  $u = \ln u \rightarrow du = \frac{1}{u} du$ B.  $u = \ln u \rightarrow du = \frac{1}{u} du$ 

b. 
$$\int_{-\infty}^{\infty} \frac{x}{(x^2+4)} dx$$
Jawab:

2.) b. 
$$\int_{-\infty}^{\infty} \frac{x}{x^{2}+4} dx$$

$$= \int_{-\infty}^{0} \frac{x}{x^{4}+4} dx + \int_{0}^{\infty} \frac{x}{x^{2}+4} dx$$

$$= \lim_{\alpha \to -\infty} \int_{0}^{\infty} \frac{x}{x^{2}+4} dx + \lim_{\beta \to \infty} \int_{0}^{\infty} \frac{x}{x^{2}+4} dx$$

$$= \lim_{\alpha \to -\infty} \int_{0}^{\infty} \frac{x}{x^{2}+4} dx + \lim_{\beta \to \infty} \int_{0}^{\infty} \frac{x}{x^{2}+4} dx$$

$$= \lim_{\alpha \to \infty} \int_{0}^{4} \frac{1}{2^{2}} du + \lim_{\beta \to \infty} \int_{0}^{1} \frac{1}{2^{2}} du$$

$$= \lim_{\alpha \to \infty} \int_{0}^{4} \frac{1}{2^{2}} du + \lim_{\beta \to \infty} \int_{0}^{1} \frac{1}{2^{2}} du$$

$$= \lim_{\alpha \to \infty} \int_{0}^{1} \frac{\ln u}{2^{2}} du + \lim_{\beta \to \infty} \int_{0}^{1} \frac{\ln u}{2^{2}} du$$

$$= \dim_{0}^{1} \int_{0}^{1} \frac{\ln u}{2^{2}} du + \lim_{\beta \to \infty} \int_{0}^{1} \frac{\ln u}{2^{2}} du$$

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## 3. Tentukan integral berikut

a. 
$$\int_{2}^{\infty} \frac{1}{x \ln x} dx$$
Jawab:

3) a) 
$$\int_{2}^{\infty} \frac{1}{x \ln x} dx = \lim_{\alpha \to \infty} \int_{2}^{\alpha} \frac{1}{x \ln x} dx = \lim_{\alpha \to \infty} \int_{2}^{\alpha} \frac{1}{t} dt = \lim_{\alpha \to \infty} \left[ \ln(|t|) \right]_{2}^{\alpha}$$

mikalkan  $t = \ln(x)$ ,  $t' = \frac{1}{x}$ 

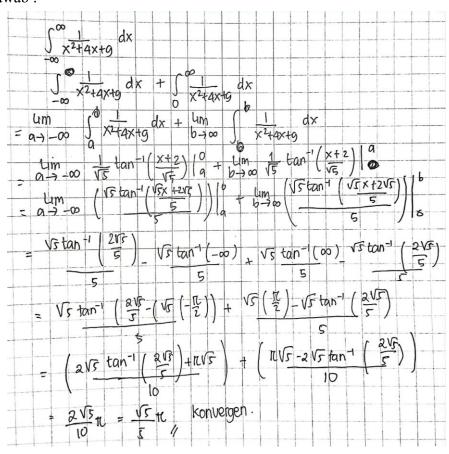
$$\frac{dt}{dx} = \frac{1}{x}$$

$$dt = \frac{1}{x} dx$$

$$= \lim_{\alpha \to \infty} \left[ \ln(|\ln x|) \right]_{2}^{\alpha}$$

$$= \lim_{\alpha \to \infty} \left[ \ln(|\ln x|) - \ln(|\ln x|) \right]$$
(Pivergen)

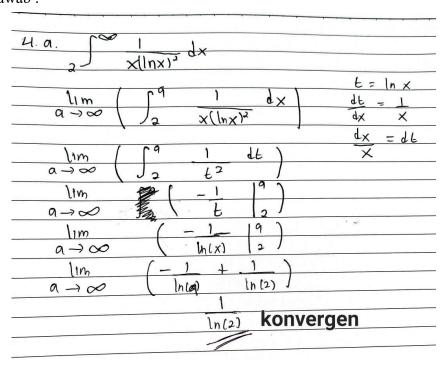
b. 
$$\int_{-\infty}^{\infty} \frac{1}{x^2 + 4x + 9} dx$$
  
Jawab :



### 4. Tentukan integral berikut

a. 
$$\int_2^\infty \frac{1}{x (\ln x)^2} dx$$

Jawab:



b. 
$$\int_{-\infty}^{\infty} \frac{x}{e^{|x|}} dx$$
Jawab:

4b. 
$$\int_{-\infty}^{\infty} \frac{x}{e^{1x1}} dx = \int_{-\infty}^{0} \frac{x}{e^{1x1}} dx + \int_{0}^{\infty} \frac{x}{e^{1x1}} dx$$

$$= \lim_{\alpha \to -\infty} \int_{0}^{0} \frac{x}{e^{-x}} dx + \lim_{b \to \infty} \int_{0}^{b} \frac{x}{e^{x}} dx$$

$$= \lim_{\alpha \to -\infty} \int_{0}^{0} \frac{x}{e^{-x}} dx + \lim_{b \to \infty} \int_{0}^{b} \frac{x}{e^{x}} dx$$

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