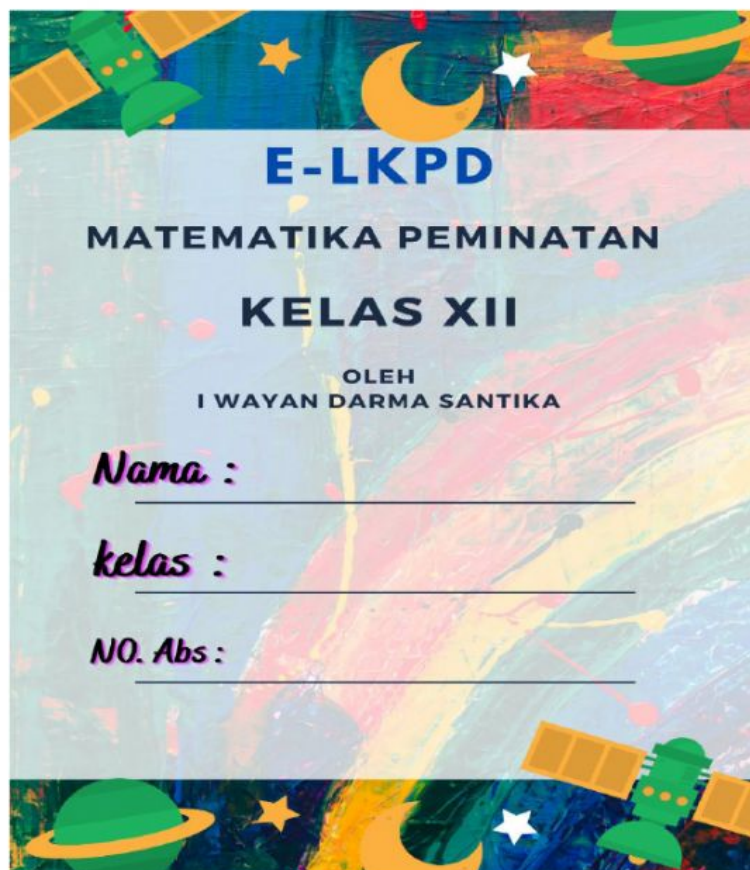




Kegiatan Belajar 2

Tugas 3



SMA NEGERI 1 BEBANDEM

2021

Metode pemfaktoran

Contoh soal

$$1. \lim_{x \rightarrow 0} \frac{\sin 2x + \sin^2 x}{\sin x}$$

$$2. \lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x}$$

Penyelesaian

No	Langkah penyelesaian	Rumus yang digunakan
1	$\lim_{x \rightarrow 0} \frac{\sin 2x + \sin^2 x}{\sin x}$ $= \lim_{x \rightarrow 0} \frac{2 \sin x \cdot \cos x + \sin x \cdot \sin x}{\sin x}$ $= \lim_{x \rightarrow 0} \frac{\sin x (2 \cos x + \sin x)}{\sin x}$ $= \lim_{x \rightarrow 0} (2 \cos x + \sin x)$ $= 2 \cos 0 + \sin 0$ $= 2(1) + 0$ $= 2$	$\sin 2x = 2 \sin x \cdot \cos x$ $\sin^2 x = \sin x \cdot \sin x$
2	$\lim_{x \rightarrow 0} \frac{1 - \cos x}{\sin^2 x}$ $= \lim_{x \rightarrow 0} \frac{1 - \cos x}{1 - \cos^2 x}$ $= \lim_{x \rightarrow 0} \frac{1 - \cos x}{1^2 - \cos^2 x}$ $= \lim_{x \rightarrow 0} \frac{1 - \cos x}{(1 - \cos x) \cdot (1 + \cos x)}$ $= \lim_{x \rightarrow 0} \frac{1}{(1 + \cos x)} = \frac{1}{(1 + \cos 0)}$ $= \frac{1}{(1+1)} = \frac{1}{2}$	$\sin^2 x = 1 - \cos^2 x$ $a^2 - b^2 = (a - b) \cdot (a + b)$ $1 - \cos^2 x = 1^2 - \cos^2 x$ $1^2 - \cos^2 x = (1 - \cos x) \cdot (1 + \cos x)$

Latihan soal

1. $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin^2 x - \cos^2 x}{\sin x - \cos x}$

2. $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos^2 x + \sin x \cos x}{\cos x}$

3. $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{1 - \tan x}$

4. $\lim_{x \rightarrow 0} \frac{\cos 5x - \cos 3x}{\sin 5x + \sin 3x}$

No	Langkah penyelesaian	Rumus yang digunakan
1	$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin^2 x - \cos^2 x}{\sin x - \cos x}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{(\sin x - \cos x)(\sin x + \cos x)}{\sin x - \cos x}$ $= \lim_{x \rightarrow \frac{\pi}{4}} (\sin x + \cos x)$ $= \sin \frac{\pi}{4} + \cos \frac{\pi}{4}$ $= \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}$ $= \sqrt{2}$	$\sin^2 x - \cos^2 x$ $= (\sin x - \cos x)(\sin x + \cos x)$

No	Langkah penyelesaian	Rumus yang digunakan
2	$\lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos^2 x + \sin x \cos x}{\cos x}$ $= \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x \cdot (\dots x) + \sin x \cos x}{\cos x}$ $= \lim_{x \rightarrow \frac{\pi}{2}} \frac{\cos x (\dots x + \sin \dots)}{\cos x}$ $= \lim_{x \rightarrow \frac{\pi}{2}} (\dots x + \sin \dots)$ $= \dots \frac{\pi}{2} + \sin \frac{\pi}{2}$ $= \dots + \dots$ $= \dots$	$\cos^2 x = \cos x \cdot (\dots x)$
3	$\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{1 - \tan x}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{1 - \frac{\dots x}{\dots x}}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{\frac{\dots x}{\dots x} - \frac{\dots x}{\dots x}}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{\dots x - \dots x} \cdot \frac{\cos x}{\cos x}$ $= \lim_{x \rightarrow \frac{\pi}{4}} \frac{\sin x - \cos x}{\dots (\sin x \dots \cos x)} \cdot \frac{\cos x}{\cos x}$	$\tan x = \frac{\dots x}{\dots x}$ Proses menyamakan penyebutnya $1 - \frac{\dots x}{\dots x}$ $= \frac{\dots x}{\dots x} - \frac{\dots x}{\dots x}$ $\dots x - \dots x$ $= -(\sin x \dots \cos x)$

No	Langkah penyelesaian	Rumus yang digunakan
	$= \lim_{x \rightarrow \frac{\pi}{4}} \dots \cos x$ $= \dots \frac{\pi}{4}$ $= \dots \frac{\dots}{\dots} \sqrt{\dots}$	
4	$\lim_{x \rightarrow 0} \frac{\cos 5x - \cos 3x}{\sin 5x + \sin 3x}$ $= \lim_{x \rightarrow 0} \frac{-2 \sin \dots x \cdot \sin \dots}{2 \sin \dots x \cdot \dots x}$ $= \lim_{x \rightarrow 0} \frac{-\sin \dots}{\dots x}$ $= \frac{-\sin \dots}{\dots 0}$ $= \dots$	$\cos 5x - \cos 3x$ $= -2 \sin \dots x \cdot \sin \dots$ $\sin 5x + \sin 3x$ $= 2 \sin \dots x \cdot \dots x$