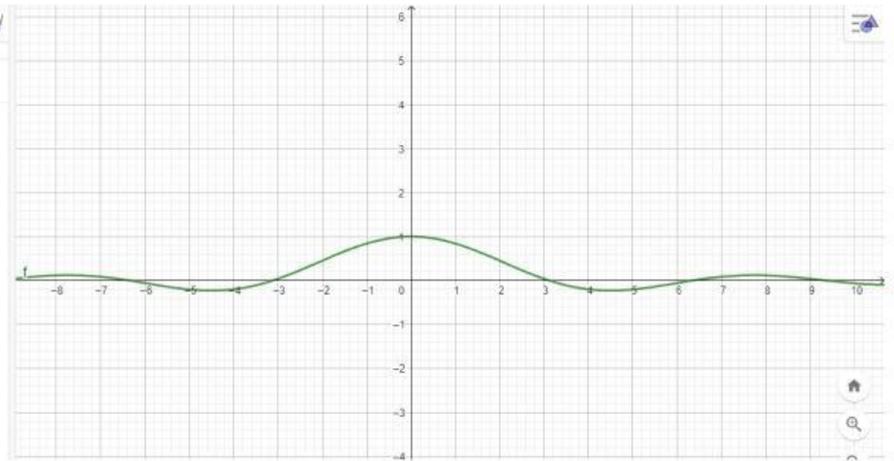## LEMBAR KERJA 1
TURUNAN TRIGONOMETRI

Limit Turunan Trigonometri

A.   LIMIT TRIGONOMETRI

1)   Limit sinus bentuk 1

$f(x) = \dfrac{\sin(x)}{x}$
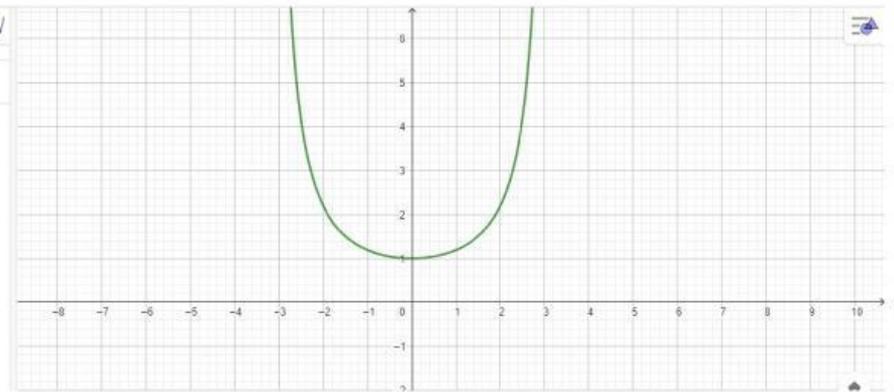
Input...

$$\lim_{x \to 0} \frac{\sin x}{x} = \ldots.$$

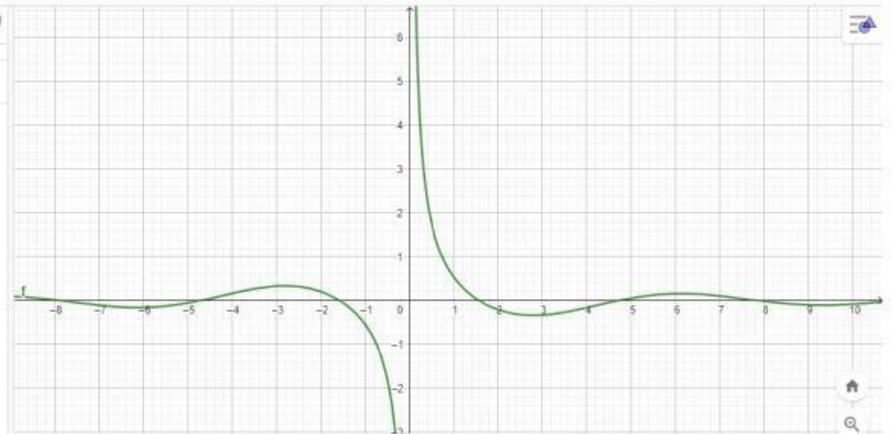2)   Limit sinus bentuk 2

$f(x) = \dfrac{x}{\sin(x)}$

Input...

$$\lim_{x \to 0} \frac{x}{\sin x} = \ldots.$$

by Pungky Rahmawati, S.Pd   **SMA Brawijaya Smart School Malang**

LIVEWORKSHEETS

3) Limit cosinus bentuk 1

$f(x) = \dfrac{\cos(x)}{x}$

Input...
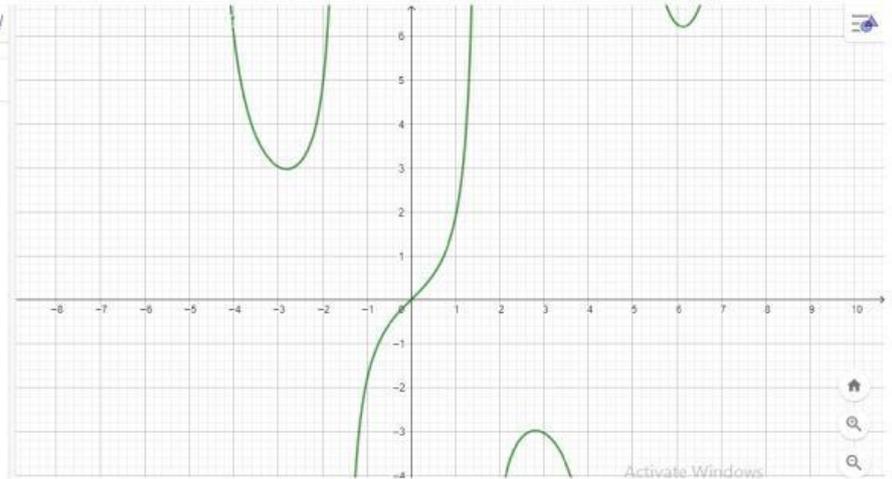
$$\lim_{x \to 0} \frac{\cos x}{x} = ...$$

4) Limit cosinus bentuk 2

$f(x) = \dfrac{x}{\cos(x)}$

Input...

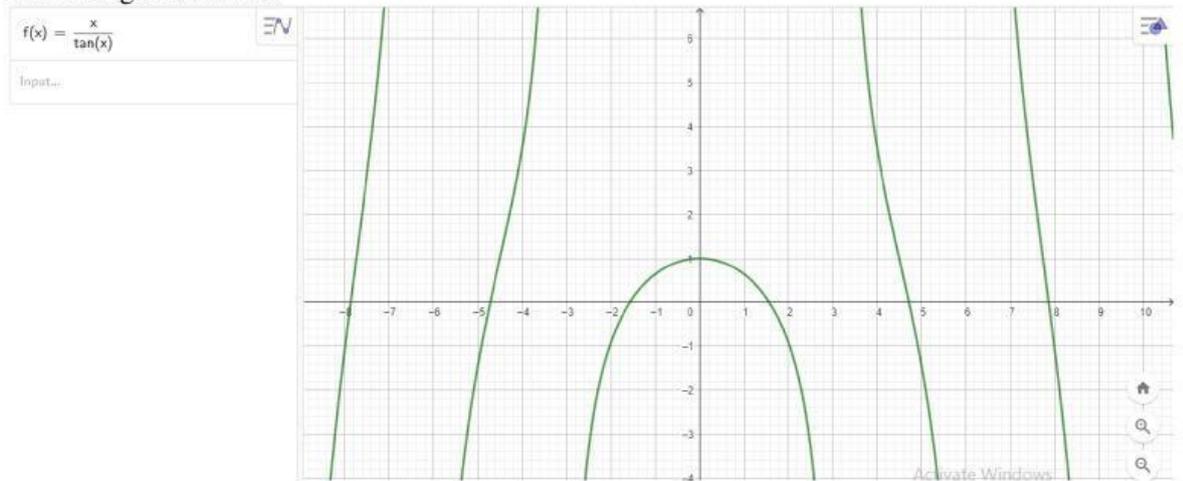$$\lim_{x \to 0} \frac{x}{\cos x} = ...$$

5) Limit tangen bentuk 1

$f(x) = \dfrac{\tan(x)}{x}$

Input...
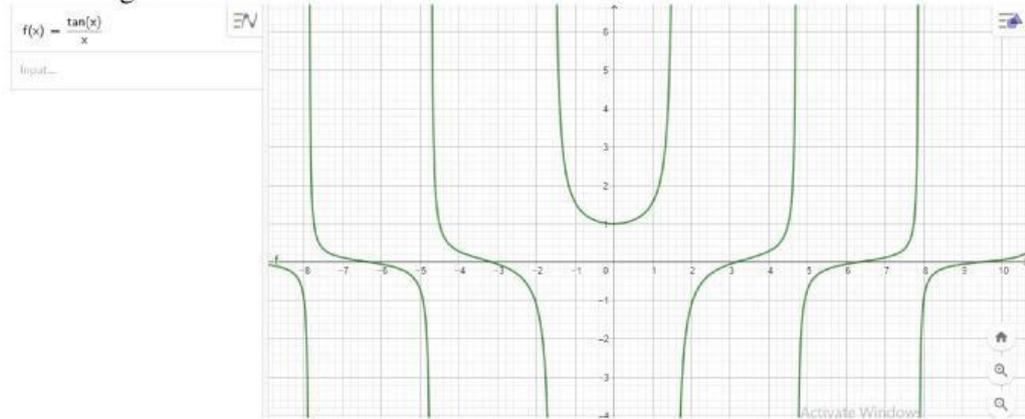
$$\lim_{x \to 0} \frac{\tan x}{x} = \ldots.$$

6) Limit tangen bentuk 2

$f(x) = \dfrac{x}{\tan(x)}$

Input...

$$\lim_{x \to 0} \frac{x}{\tan x} = \ldots.$$

B.   LIMIT TURUNAN TRIGONOMETRI

1) Turunan sinus

$f(x) = \sin x$

$f'(x) = \lim_{h \to 0} \dfrac{f(x+h) - f(x)}{h}$

$= \lim_{h \to 0} \dfrac{\sin(x+h) - \sin(x)}{h}$

$= \lim_{h \to 0} \dfrac{2.........\left(\dfrac{(............) + ...}{2} \right).........\left(\dfrac{(............) - .....}{2} \right)}{h}$

$= \lim_{h \to 0} \dfrac{2.........\left(\dfrac{.............}{2} \right).........\left(\dfrac{.............}{2} \right)}{h}$

$= \lim_{h \to 0} ....\left(\dfrac{.............}{2} \right).\lim_{h \to 0} \dfrac{2.\sin\left(\dfrac{.............}{2} \right)}{h}.\left(\dfrac{\left(\dfrac{...}{...} \right)}{\left(\dfrac{...}{...} \right)} \right)$

$= ....\left(\dfrac{..... + ...}{2} \right).1$

$= ....\left(\dfrac{.............}{2} \right)$

$= ....$

2) Turunan cosinus

$$f(x) = \cos x$$

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$

$$= \lim_{h \to 0} \frac{\cos(x+h) - \cos(x)}{h}$$

$$= \lim_{h \to 0} \frac{2\ldots\ldots\left(\dfrac{(\ldots\ldots) + \ldots\ldots}{2}\right)\ldots\ldots\left(\dfrac{(\ldots\ldots) - \ldots\ldots}{2}\right)}{h}$$

$$= \lim_{h \to 0} \frac{2\ldots\ldots\left(\dfrac{\ldots\ldots\ldots}{2}\right)\ldots\ldots\left(\dfrac{\ldots\ldots\ldots}{2}\right)}{h}$$

$$= \lim_{h \to 0} \ldots\ldots\left(\frac{\ldots\ldots\ldots}{2}\right).\lim_{h \to 0} \frac{2.\sin\left(\dfrac{\ldots\ldots\ldots}{2}\right)}{h}.\left(\dfrac{\left(\dfrac{\ldots}{\ldots}\right)}{\left(\dfrac{\ldots}{\ldots}\right)}\right)$$

$$= \ldots\ldots\left(\frac{\ldots\ldots + \ldots\ldots}{2}\right).1$$

$$= \ldots\ldots\left(\frac{\ldots\ldots\ldots}{2}\right)$$

$$= \ldots\ldots\ldots$$

3) Turunan tangen

$$f(x) = \tan x = \frac{\ldots\ldots\ldots}{\ldots\ldots\ldots} = \frac{u}{v}$$

$$u = \ldots\ldots\ldots \rightarrow u' = \ldots\ldots\ldots$$

$$v = \ldots\ldots\ldots \rightarrow v' = \ldots\ldots\ldots$$

$$f'(x) = \frac{u'v - uv'}{v^2}$$

$$= \frac{(\ldots\ldots\ldots)(\ldots\ldots\ldots) - (\ldots\ldots\ldots)(\ldots\ldots\ldots)}{(\ldots\ldots\ldots)^2}$$

$$= \frac{(\ldots\ldots\ldots)^2 \ldots\ldots (\ldots\ldots\ldots)^2}{(\ldots\ldots\ldots)^2}$$

$$= \frac{\ldots\ldots\ldots}{(\ldots\ldots\ldots)^2}$$

$$= (\ldots\ldots\ldots)^2$$