

ZCA 110 Kalkulus dan Aljabar

Semester I, Sessi 2005/06

QUIZ 6 (26 August 2005)

Nama:

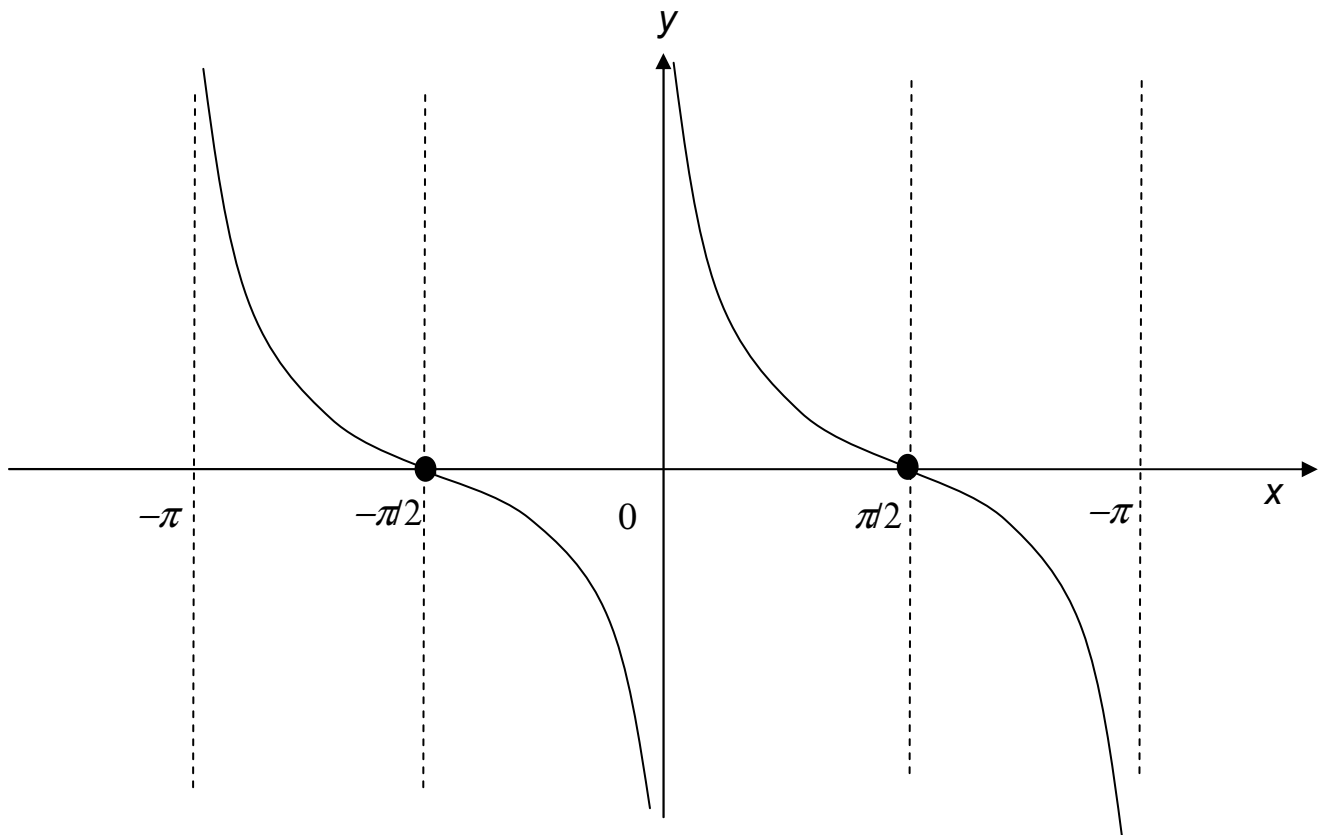
No. Kad Matriks:

Kumpulan Tutorial:

[total 4+3 marks = 7 marks]

(a) Sketch the curve of $y = \cot x$ for $-\pi \leq x \leq \pi$. Please label your sketch clearly [4 marks]

Solution:



(b)

Given $y = \tan^{-1}\left(\frac{b}{a} \tan x\right)$, find y' . [Hint: For $h = \tan^{-1} x$, $h' = \frac{1}{1+x^2}$] [3 marks]

pg 171, Solved Problem 8

Let $u(x) = \frac{b}{a} \tan x$.

$$\begin{aligned} \frac{d}{dx} \left[\tan^{-1} \left(\frac{b}{a} \tan x \right) \right] &= \frac{d}{dx} \left[\tan^{-1} u(x) \right] = \frac{d}{du} \left[\tan^{-1} u(x) \right] \cdot \frac{du(x)}{dx} \\ &= \frac{1}{1+u(x)^2} \cdot \frac{b}{a} \sec^2 x = \frac{b}{a} \frac{1}{1+\left(\frac{b}{a} \tan x\right)^2} \cdot \sec^2 x = \frac{ab \sec^2 x}{a^2 + b^2 \tan^2 x} \end{aligned}$$