

ZCA 110 Kalkulus dan Aljabar

Semester I, Sessi 2005/06

QUIZ 8 (16 Sept 2005)

Nama:

No. Kad Matriks:

Kumpulan Tutorial:

[total (3 + 2 + 3) marks = 8 marks]

Evaluate $\int_0^{\pi/2} \sin^2 x \cos x dx$

[3 marks]

Solution: SP1, pg. 218

Let $u = \sin x, du = \cos x dx$

$x = 0, u = 0; x = \frac{\pi}{2}, u = 1;$

$$\int_0^{\pi/2} \sin^2 x \cos x dx = \int_0^1 u^2 du = \frac{u^3}{3} \Big|_0^1 = \frac{1}{3}$$

Evaluate $\frac{d}{dx} \int_0^x t^2 dt$

Solution: SupP 30, pg. 223: $\frac{d}{dx} \int_0^x t^2 dt = x^2$

[2 marks]

(c) Given $y = \ln(\tan x)$, find $\frac{dy}{dx}$.

Solution: $\frac{d}{dx} [\ln \tan x] = \frac{\frac{d}{dx} [\tan x]}{\tan x} = \frac{\sec^2 x}{\tan x}$

[2 marks]

$$= \frac{\cos x}{\sin x} \frac{1}{\cos^2 x} = \frac{1}{\sin x \cos x} = \frac{2}{2 \sin x \cos x} = \frac{2}{\sin 2x}$$

[1 marks]