UNIVERSITI SAINS MALAYSIA

Peperiksaan Kursus Semester Cuti Panjang
Sidang Akademik 2002/2003

April 2003

IUK 191 – MATEMATIK I

Masa : 3 jam

Sila pastikan bahawa kertas peperiksaan ini mengandungi LIMA mukasurat yang bercetak sebelum anda memulakan peperiksaan ini.

Jawab EMPAT (4) soalan. Semua soalan mesti dijawab dalam Bahasa Malaysia.

1. (a) Find the natural domain of the function

$$f(x)=\sqrt{\frac{x-1}{x+2}}$$

(30 marks)

(b) Find a value for the constant k, if possible, that will make the function continuous

$$f(x)=\begin{cases} kx^2 & x\leq 2 \\ 2x+k & x\rangle 2 \end{cases}$$

(20 marks)

(c) Find $f'(x)$ and determine those values of x for which $f'(x)=0$

$$f(x)=\sqrt{x}\ \sqrt[3]{x^3+x+1}$$

(50 marks)

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1. (a) Cari domain tabii bagi fungsi

$$f(x)=\sqrt{\frac{x-1}{x+2}}$$

(30 markah)

(b) Cari suatu nilai untuk pemalar k, jika boleh, yang akan menjadikan fungsi berikut berterusan.

$$f(x)=\begin{cases} kx^2 & x\leq 2 \\ 2x+k & x\rangle 2 \end{cases}$$

(20 markah)

(c) Cari f'(x) dan tentukan nilai-nilai x yang f'(x) = 0

$$f(x)=\sqrt{x}\ \sqrt[3]{x^3+x+1}$$

(50 markah)

2. (a) Sketch the graph of

$$y = \frac{2x^2 - 8}{x^2 - 16}$$

(40 marks)

(b) Use Newton's method to approximate the real solution of

$x^3 - x - 1 = 0$, let $x_1 = 1.5$

(40 marks)

(c) Calculate

$$\frac{1}{3 + 4i}$$

(20 marks)

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2. *(a) Lakarkan geraf*

$$y = \frac{2x^2 - 8}{x^2 - 16}$$

(40 markah)

(b) Gunakan kaedah Newton untuk menganggarkan selesaian hakiki bagi

$x^3 - x - 1 = 0$, *let* $x_1 = 1.5$

(40 markah)

(c) Kira

$$\frac{1}{3 + 4i}$$

(20 markah)

3. (a) Find the volume of the solid generated when the region between the graphs of $f(x) = \frac{1}{2} + x^2$ and $g(x) = x$ over the interval [0,2] is revolved about the x-axis.

(40 marks)

(b) Find

(i) $\int \frac{dx}{x^2\sqrt{4-x^2}}$

(40 marks)

(ii) $\int x\sqrt{x^2-4}dx$

(20 marks)

3. *(a) Cari isipadu pepejal terjana apabila kawasan antara geraf* $f(x) = \frac{1}{2} + x^2$ *dan* $g(x) = x$ *bagi jeda [0,2] diputarkan pada paksi x.*

(40 markah)

(b) Cari

(i) $\int \frac{dx}{x^2\sqrt{4-x^2}}$

(40 markah)

(ii) $\int x\sqrt{x^2-4}dx$

(20 markah)

4. (a) Solve the system

$$x+2y-z=0$$
$$-x+y+2z=0$$
$$-2x-y+3z=0$$

(50 marks)

(b) Solve the equation

$$y'-4xy=x$$

(50 marks)

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4. *(a) Selesaikan sistem*

$$x+2y-z=0$$
$$-x+y+2z=0$$
$$-2x-y+3z=0$$

(50 markah)

(b) Selesaikan persamaan

$$y'-4xy=x$$

(50 markah)

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