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UNIVERSITI SAINS MALAYSIA

Peperiksaan Kursus Semester Cuti Panjang  
Sidang Akademik 2002/2003

April 2003

**IUK 191 – MATEMATIK I**

Masa : 3 jam

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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.

...2/-

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

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

(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)

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.

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

(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)

...3/-

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

$$x^3 - x - 1 = 0, \text{ let } x_1 = 1.5$$

(40 marks)

- (c) Calculate

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

(20 marks)

2. (a) *Lakarkan graf*

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

(40 markah)

- (b) *Gunakan kaedah Newton untuk menganggarkan penyelesaian hakiki bagi*

$$x^3 - x - 1 = 0, \text{ let } x_1 = 1.5$$

(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 graf

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

$$\begin{aligned}x + 2y - z &= 0 \\ -x + y + 2z &= 0 \\ -2x - y + 3z &= 0\end{aligned}$$

(50 marks)

(b) Solve the equation

$$y' - 4xy = x$$

(50 marks)

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4. (a) *Selesaikan sistem*

$$\begin{aligned}x + 2y - z &= 0 \\ -x + y + 2z &= 0 \\ -2x - y + 3z &= 0\end{aligned}$$

(50 markah)

(b) *Selesaikan persamaan*

$$y' - 4xy = x$$

(50 markah)

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