SULIT

POLITEKNIK MALAYSIA

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN TINGGI

JABATAN MATEMATIK, SAINS DAN KOMPUTER

PEPERIKSAAN AKHIR

SESI JUN 2015

DBM1042: MATHEMATICS

TARIKH : 23 OKTOBER 2015
MASA : 8.30 AM - 10.30 AM (2 JAM)

Kertas ini mengandungi **LIMA BELAS (15)** halaman bercetak.
Bahagian A: Struktur (4 soalan, jawab 3 soalan)
Bahagian B: Struktur (2 soalan, jawab 1 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SECTION A : 75 MARKS
BAHAGIAN A : 75 MARKAH

INSTRUCTION:
This section consists of **FOUR (4)** structured questions. Answer **THREE (3)** questions only.

ARAHAN:
*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **TIGA (3)** soalan sahaja.*

QUESTION 1
SOALAN 1

CLO1 C2 (a) Simplify the following fractions into its simplest form:

Permudahkan pecahan berikut kepada bentuk termudah:

i. $\dfrac{8st^3\left(5s^2\right)}{10t}$ [3 marks]

[*3 markah*]

ii. $\left(\dfrac{2}{2x}\right)-\left(\dfrac{2x-1}{2x^2}\right)$ [3 marks]

[*3 markah*]

iii. $\left(\dfrac{2k+4}{k-2}\right)\div\left(\dfrac{k+2}{3k-6}\right)$ [4 marks]

[*4 markah*]

CLO2 C3 (b) Given that $\dfrac{5m+4}{m-n}=3$, express m in terms of n. [5 marks]

Diberi $\dfrac{5m+4}{m-n}=3$ *, nyatakan m di dalam sebutan n.* [*5 markah*]

CLO2 C3 (c) Given that $g=\dfrac{4p+pr}{3}$, express p in terms of g and r. [3 marks]

Diberi $g=\dfrac{4p+pr}{3}$ *, nyatakan p di dalam sebutan g dan r.* [*3 markah*]

CLO2
C3

(d) Solve the following quadratic equations using Factorization.

Selesaikan setiap persamaan kuadratik yang berikut dengan menggunakan Pemfaktoran.

i. $x^2 + 5x + 6 = 0$ [3 marks]
[*3 markah*]

ii. $x^2 = 9x - 18$ [4 marks]
[*4 markah*]

QUESTION 2
SOALAN 2

CLO1
C2

a) Figure 2 (a) shows 3 rectangular with different sizes.
Rajah 1 terdiri daripada 3 segiempat tepat yang berlainan saiz.

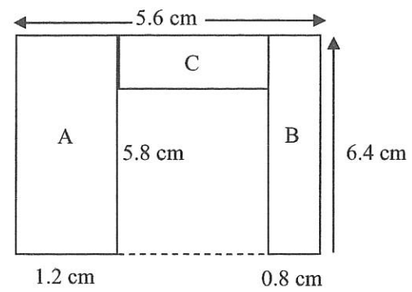


Figure 2(a)

Rajah 2(a)

(i) Calculate the perimeter of Figure 2 (a). [5 marks]
Kirakan perimeter Rajah 2 (a) [*5 markah*]

(ii) Calculate the area of A, B and C. [5 marks]
Kirakan luas bagi A, B dan C. [*5 markah*]

CLO2
C3

b) As shown in Figure 2 (b), given diameter of cylinder is 12 cm and its height is 28 cm.

Merujuk kepada rajah 2 (b), diberi diameter silinder adalah 12 cm dan tingginya 28 cm.

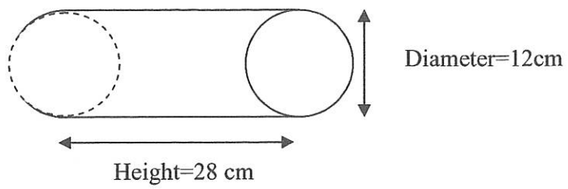


Figure 2 (b)

Rajah 2(b)

i) Calculate the volume of the Figure 2(b). [5 marks]
Kirakan isipadu bagi Rajah 2 (b). [5 *markah*]

ii) Calculate the surface area of the Figure 2(b). [10 marks]
Kira luas permukaan bagi Rajah 2 (b).. [10 *markah*]

QUESTION 3
SOALAN 3

CLO2
C3

a) Given that $\sin\theta = \frac{3}{5}$, $\cos\theta = \frac{4}{5}$, and $\tan\theta = \frac{3}{4}$. Find the value of:

Diberi $\sin\theta = \frac{3}{5}$, $\cos\theta = \frac{4}{5}$, *dan* $\tan\theta = \frac{3}{4}$. *Dapatkan nilai bagi:*

i. $\sec\theta$ [3 marks]
[*3 markah*]

ii. $\cos ec\theta$ [3 marks]
[*3 markah*]

iii. $\cot\theta$ [3 marks]
[*3 markah*]

CLO2
C3

b) Find the value of the trigonometric function in each of the following by using reference angle:

Cari nilai fungsi trigonometri setiap yang berikut dengan menggunakan sudut rujukan:

i. sin (150°) [3 marks]
[*3 markah*]

ii. cos (240°) [3 marks]
[*3 markah*]

CLO2
C3

c) Find the angles, θ between $0^o \leq x \leq 360^o$ for the following equation:

Cari semua sudut, θ dalam julat $0^o \leq x \leq 360^o$ untuk persamaan berikut:

i. $\cos \theta = -0.2028$ [3 marks]
[*3 markah*]

ii. $\sin \theta = 0.4540$ [3 marks]
[*3 markah*]

iii. $\cot \theta = 1.9626$ [4 marks]
[*4 markah*]

QUESTION 4
SOALAN 4

CLO1
C2

a) Integrate the following functions below:
Kamirkan setiap fungsi di bawah:

i) $\int (15x^3 - 4x + 9)dx$ [3 marks]
[*3 markah*]

ii) $\int \left(\frac{2}{5t^3} - \frac{1}{t^2}\right)dt$ [3 marks]
[*3 markah*]

iii) $\int (6p - 1)(p + 2)\, dp$ [3 marks]
[*3 markah*]

iv) $\int \frac{x^2 + 4}{x^4} dx$ [3 marks]
[*3 markah*]

v) $\int (2x - 6)^5 dx$ [3 marks]
[*3 markah*]

vi) $\int_{-1}^{0} (3x^2 - x + 7)\, dx$ [5 marks]
[*5 markah*]

vii) $\int_{1}^{2} (2x^2 - 5)(2x + 1)\, dx$ [5 marks]
[*5 markah*]

SECTION B : 25 MARKS
BAHAGIAN B : 25 MARKAH

INSTRUCTION:
This section consists of **TWO (2)** structured questions. Answer **ONE (1)** questions only.

ARAHAN:
*Bahagian ini mengandungi **DUA (2)** soalan berstruktur. Jawab **SATU (1)** soalan sahaja.*

CLO1
C2

QUESTION 5
SOALAN 5

a) Draw each of the angle below:

Lukiskan setiap sudut di bawah:

i) Right angle [1 mark]
Sudut Tepat [*1 markah*]

ii) Acute angle [1 mark]
Sudut Tirus [*1 markah*]

iii) Obtuse angle [1mark]
Sudut Cakah [*1 markah*]

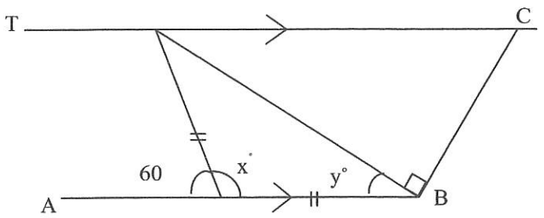
iv) Reflex angle [1mark]
Sudut Refleks [*1 markah*]

CLO2
C3

b) Calculate each of the angle for the figure below:

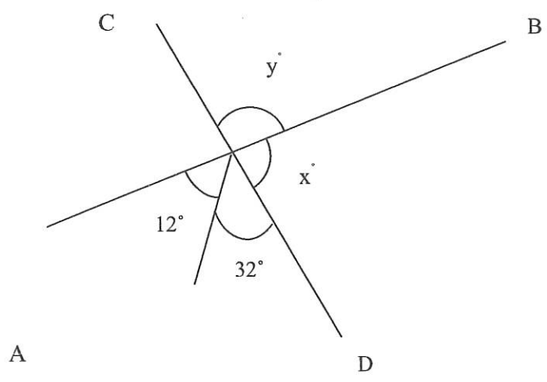
Kirakan setiap sudut yang bagi rajah di bawah

i)



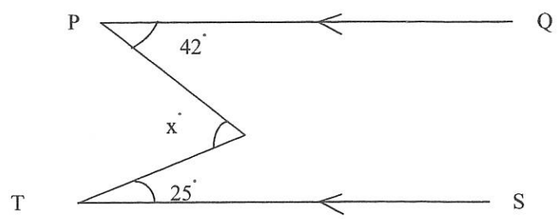
[4 marks]
[*4 markah*]

ii)



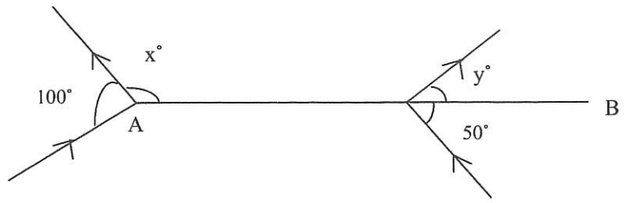
[4 marks]
[*4 markah*]

iii)



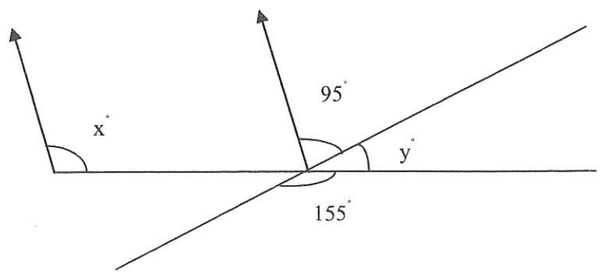
[3 marks]
[*3 markah*]

iv)



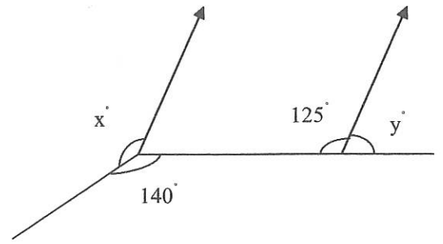
[4 marks]
[*4 markah*]

v)



[4 marks]
[*4 markah*]

vi)



[2 marks]
[*2 markah*]

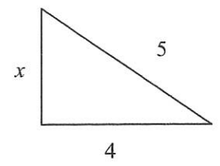
QUESTION 6
SOALAN 6

CLO1
C2

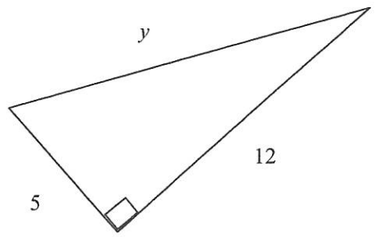
(a) Find the value of x, y and z for the following figure : [6 marks]

Cari nilai bagi x, y dan z bagi rajah berikut : [*6 markah*]

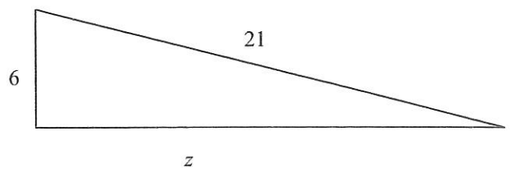
i.



ii.



iii.



CLO 2
C3

(b) Figure 6 (b) shows a square ABCE. Given the area of the square is 144 cm^2. Calculate the value of z.
Rajah 6 (b) menunjukkan sebuah segiempat sama ABCE dan diberikan luasnya ialah 144cm^2. Kirakan nilai bagi z. [4 marks]
[*4 markah*]

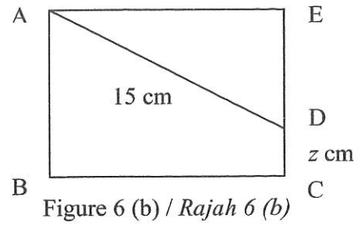


Figure 6 (b) / *Rajah 6 (b)*

CLO1
C2

(c) Convert the following angle in radian to degree without using calculator.
Tukarkan sudut dalam unit radian ke darjah tanpa menggunakan kalkulator.

i. 1.9 rad [2 marks]
[*2 markah*]

ii. $\frac{2\pi}{3}$ rad [2 marks]
[*2 markah*]

CLO 2
C3

(d) The Figure 6 (d) shows a semicircle ABE with centre O. CAF is a sector with centre A. Given that OE =EF = 9 cm. Using $\pi = 3.142$, find :

Rajah 6 (d) menunjukkan semi bulatan ABE berpusat di O. CAF adalah sektor bulatan berpusat di A. diberi OE = EF = 9cm. Dengan mengganggap π = 3.142, Cari :

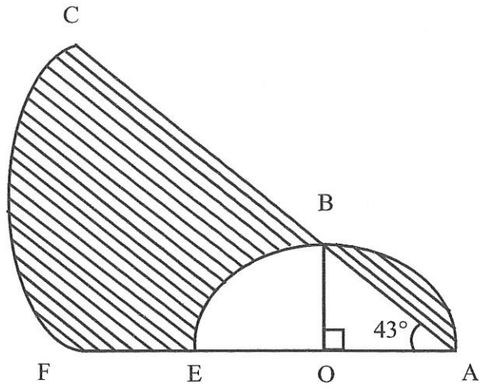


Figure 6 (d) / *Rajah 6 (d)*

i. Area of sector CAF [4 marks]
Luas sektor CAF [*4 markah*]

ii. Area of shaded region [7 marks]
Luas kawasan berlorek [*7 markah*]

SOALAN TAMAT

FORMULA SHEET FOR MATHEMATICS –DBM1042

SOLVING QUADRATIC EQUATION

$$ax^2 - bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

SURFACE AREA AND VOLUME

Cylinder :

$$A = 2\pi r h + 2\pi r^2$$
$$V = \pi r^2 h$$

Cone:

$$A = \pi r s + \pi r^2$$
$$V = \frac{1}{3}\pi r^2 h$$

Sphere:

$$A = 4\pi r^2$$
$$V = \frac{4}{3}\pi r^3$$

Pyramid:

$$A = Area\ of\ four\ triangles + area\ of\ base$$
$$V = \frac{1}{3} \times Area\ of\ base \times height$$

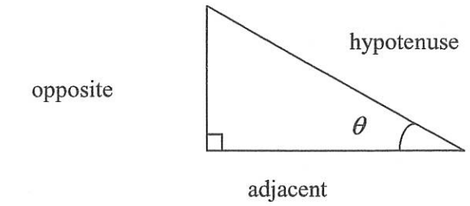
Prism

$$A = Area\ of\ 3\ rectagular\ faces + area\ of\ 2\ trigular\ faces$$
$$V = Area\ triangle \times length$$

Area Triangle

$$Area\ of\ triangle = \frac{1}{2} ab \sin C$$

TRIGONOMETRY



$$\tan\theta = \frac{opposite}{adjacent}$$

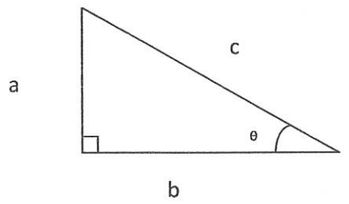
$$\sin\theta = \frac{opposite}{hypotenuse}$$

$$\cos\theta = \frac{adjacent}{hypotenuse}$$

$$\cos ec\,\theta = \frac{1}{\sin\theta}$$

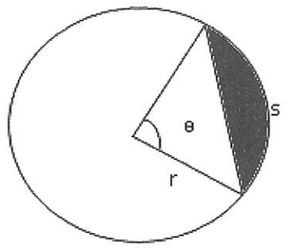
$$\cot\theta = \frac{1}{\tan\theta}$$

$$\sec\theta = \frac{1}{\cos\theta}$$



$$c^2 = a^2 + b^2$$

MEASUREMENT



$Arc\ length\ of\ a\ circle, s = r\theta$

$Area\ of\ a\ \text{sector}, A = \frac{1}{2}r^2\theta$

$Area\ of\ segment, A = \frac{1}{2}r^2\theta - \frac{1}{2}r^2\sin\theta$

INTEGRATION

INDEFINITE INTEGRAL

$$\int x^n dx = \frac{x^{n+1}}{n+1} + C$$

$$\int ax^n dx = \frac{ax^{n+1}}{n+1} + C, n \neq -1$$

$$\int (ax+b)^n dx = \frac{(ax+b)^{n+1}}{a(n+1)} + C, n \neq -1$$

DEFINITE INTEGRAL

$$\int_a^b f(x)\,dx = [F(x)]_a^b = F(b) - F(a)$$

AREA UNDER A CURVE

Along x-axis

$$A = \int_a^b y\,dx$$

Along y-axis

$$A = \int_c^d x\,dy$$

VOLUME OF SOLID OF REVOLUTION

Along x-axis

$$V = \int_a^b \pi y^2\,dx$$

Along y-axis

$$V = \int_c^d \pi x^2\,dy$$