SULIT

POLITEKNIK MALAYSIA

BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENDIDIKAN MALAYSIA

JABATAN MATEMATIK, SAINS & KOMPUTER

PEPERIKSAAN AKHIR

SESI JUN 2018

PBM2014: BASIC MATHEMATICS 2

TARIKH : 29 OKTOBER 2018
MASA : 2.30 PETANG - 4.30 PETANG (2 JAM)

Kertas ini mengandungi **SEPULUH (10)** halaman bercetak.
Bahagian A: Struktur (2 soalan)
Bahagian B: Struktur (3 soalan)

Dokumen sokongan yang disertakan : Kertas Graf, Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SECTION A: 50 MARKS
BAHAGIAN A: 50 MARKAH

INSTRUCTION:
This section consists of **TWO (2)** questions. Answer **ALL** the questions.

ARAHAN:
*Bahagian ini mengandungi **DUA (2)** soalan. Jawab **SEMUA** soalan.*

QUESTION 1
SOALAN 1

CLO1
C2

(a) Diagram A1(a) is a right angle triangle. Determine:
Rajah A1(a) adalah sebuah segitiga bersudut tegak. Tentukan:

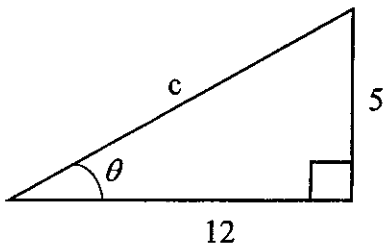


Diagram A1(a) / *Rajah A1(a)*

i. The value of c.
Nilai c.

[3 marks]
[*3 markah*]

ii. cos θ

[2 marks]
[*2 markah*]

iii. tan θ

[2 marks]
[*2 markah*]

iv. cosec θ

[3 marks]
[*3 markah*]

CLO1
C3

(b) Given a triangle ABC as shown in Diagram A1(b). Using an appropriate method, calculate:

Diberi sebuah segitiga ABC seperti di dalam Rajah A1(b). Dengan menggunakan kaedah yang bersesuaian, kirakan:

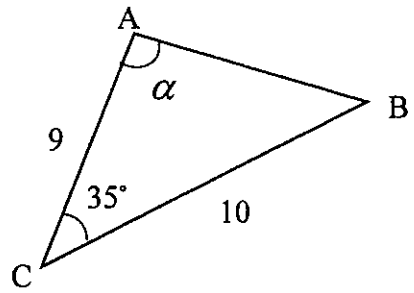


Diagram A1(b) / *Rajah A1(b)*

i. The length of AB.

Panjang AB.

[4 marks]
[*4 markah*]

ii. Angle of α.

Sudut α.

[4 marks]
[*4 markah*]

iii. The area of triangle ABC.

Luas segitiga ABC.

[2 marks]
[*2 markah*]

CLO1
C3

(c) Calculate the reference angle of 315°. Then, sketch the angle in a Cartesian plane.

Kirakan sudut rujukan bagi sudut 315°. *Kemudian, lakarkan sudut di dalam satah Cartesian.*

[5 marks]
[5 *markah*]

QUESTION 2
SOALAN 2

CLO1
C2

(a) Diagram A2(a) shows a circle with center O. Determine:
Rajah A2(a) menunjukkan sebuah bulatan dengan pusat O. Tentukan:

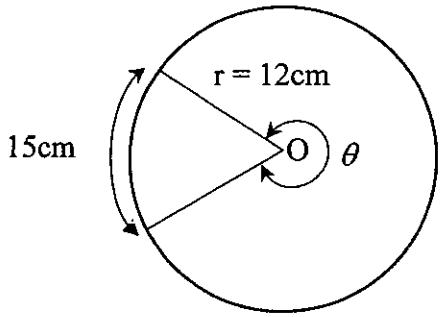


Diagram A2(a) / *Rajah A2(a)*

i. The value of θ in degree unit.
Nilai θ dalam unit darjah.

[6 marks]
[*6 markah*]

ii. Circumference of the circle.
Lilitan bulatan tersebut.

[2 marks]
[2 *markah*]

iii. Area of circle.
Luas bulatan tersebut.

[2 marks]
[2 *markah*]

CLO1
C3

(b) In Diagram A2(b), PQR is a sector with centre P. The area of this sector is 66.72cm^2. Calculate:

Dalam Rajah A2(b), PQR adalah sebuah sektor dengan pusat P. Luas sektor ini adalah 66.72cm^2. Kirakan:

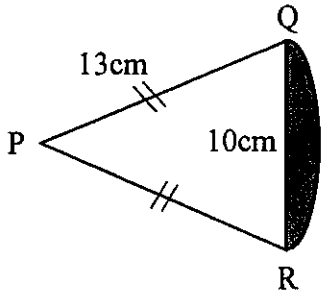


Diagram A2(b) / *Rajah A2(b)*

i. $\angle QPR$ in radians.

$\angle QPR$ dalam radian.

[4 marks]
[*4 markah*]

ii. The length of arc QR.

Panjang lengkok QR.

[2 marks]
[*2 markah*]

iii. The area of shaded region.

Luas kawasan berlorek.

[4 marks]
[*4 markah*]

CLO1
C3

(c) Find the radius of a sector if the angle subtended at the centre of the circle is 1.7 radians and its area is 13.6 cm^2.

Cari panjang jejari bagi sektor yang mempunyai sudut 1.7 radian dan keluasan 13.6cm^2.

[5 marks]
[*5 markah*]

SECTION B: 50 MARKS
BAHAGIAN B: 50 MARKAH

INSTRUCTION:
This section consists of **THREE (3)** structured questions, answer **TWO (2)** questions only.

ARAHAN:
*Bahagian ini mengandungi **TIGA (3)** soalan struktur, jawab hanya **DUA (2)** soalan sahaja.*

QUESTION 1
SOALAN 1

CLO2
C2

(a) Calculate the magnitude of the following vectors.
Kirakan magnitud vektor-vektor yang berikut.

i. $\overrightarrow{OB} = 10\mathbf{i} + 4\mathbf{j}$

[3 marks]
[3 *markah*]

ii $\overrightarrow{b} = 6\mathbf{i} - 5\mathbf{j}$

[3 marks]
[3 *markah*]

iii. $\overrightarrow{OC} = \begin{pmatrix} -7 \\ 9 \end{pmatrix}$

[4 marks]
[4 *markah*]

CLO2
C3

(b) Given r = 4**i** – 3**j** , s = – 8**i** + **j** and t = 12**j**. Determine

*Diberi r = 4**i** – 3**j** , s = – 8**i** + **j** dan t = 12**j**. Tentukan*

i. t + r – s

[3 marks]
[3 *markah*]

ii. 2s +3t

[3 marks]
[3 *markah*]

iii. Dot product of vector 4r • 3s

Hasil darab titik bagi vektor 4r • 3s

[4 marks]
[4 *markah*]

CLO2
C3

(c) Given vector M = (–7, 8) and vector N = (6, --5). Determine the angle between M and N.

Diberi vektor M = (–7, 8) dan vektor N = (6, –5). Tentukan sudut antara M dan N.

[5 marks]
[5 markah]

QUESTION 2
SOALAN 2

CLO2
C2

(a) Solve the following inequalities:
Selesaikan ketaksamaan-ketaksamaan berikut:

i. $5y > 45$

[2 marks]
[2 *markah*]

ii. $-8 < 2y$

[3 marks]
[3 *markah*]

iii. $4y < 10 + 3y$

[2 marks]
[2 *markah*]

iv. $7y - 20 > -6$

[3 marks]
[3 *markah*]

CLO2
C3

(b) If x is an integer, find the values of x that satisfy the following simultaneous inequalities and draw a number line.

Jika x adalah integer, cari nilai-nilai x yang memenuhi ketaksamaan serentak berikut dan lukis garis nombor.

i. $11 - 5x < 6$

[5 marks]
[5 *markah*]

ii. $2x + 5 \leq 21$

[5 marks]
[5 *markah*]

CLO2 C3 (c) Show the value of u in the form of number line if $12 + 9u \leq 56 - 2u$.

Tunjukkan nilai u dalam bentuk garis nombor jika $12 + 9u \leq 56 - 2u$.

[5 marks]

[5 markah]

QUESTION 3

SOALAN 3

CLO2 C2 (a) Given that $P = \begin{pmatrix} 2 & 5 \\ -1 & 3 \end{pmatrix}$ and $Q = \begin{pmatrix} 0 & 6 \\ 4 & -4 \end{pmatrix}$. Determine

Diberi bahawa $P = \begin{pmatrix} 2 & 5 \\ -1 & 3 \end{pmatrix}$ *dan* $Q = \begin{pmatrix} 0 & 6 \\ 4 & -4 \end{pmatrix}$.

Tentukan

i. $P + Q$

[2 marks]

[2 *markah*]

ii. $P^T - Q$

[3 marks]

[3 *markah*]

iii. $4Q$

[2 marks]

[2 *markah*]

iv. PQ

[3 marks]

[3 *markah*]

CLO2
C3

(b) Solve simultaneous equations of $4x + 4y = 10$ and $x - 5y = 8$ by using matrices.

Selesaikan persamaan serentak $4x + 4y = 10$ dan $x - 5y = 8$ dengan menggunakan matriks.

[10 marks]
[10 *markah*]

CLO2
C3

(c) Find the inverse matrix for the following matrix.

Dapatkan matriks songsang bagi matriks berikut

$$\begin{pmatrix} 1 & 3 \\ -2 & 8 \end{pmatrix}$$

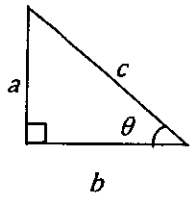
[5 marks]
[5 *markah*]

SOALAN TAMAT

FORMULA SHEET FOR BASIC MATHEMATICS 2 (PBM2014)

TRIGONOMETRY

Pythagoras' Theorem



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

reciprocal function

2. $\tan\theta = \frac{\sin\theta}{\cos\theta}$
3. $\operatorname{cosec}\theta = \frac{1}{\sin\theta}$
4. $\sec\theta = \frac{1}{\cos\theta}$
5. $\cot\theta = \frac{1}{\tan\theta}$

Formula of Triangle

6. *Sine Rules;*

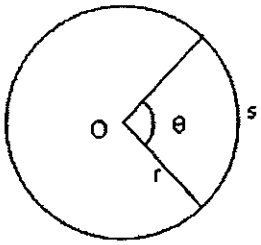
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

7. *Cosine Rules;*

$a^2 = b^2 + c^2 - 2bc\cos A$

8. *Area of Triangle* $= \frac{1}{2}ab\sin C$

CIRCULAR MEASURE



1. *Arc Length of a Circle ;*
$s = r\theta$

2. *Area of a Sector;*
$A = \frac{1}{2}r^2\theta$

3. *Area of a triangle ;*
$A = \frac{1}{2}r^2\sin\theta$

4. *Area of a Segment;*
$A = \frac{1}{2}r^2\theta - \frac{1}{2}r^2\sin\theta$

VECTOR

1. $\vec{A} \bullet \vec{B} = a_1a_2 + b_1b_2 + c_1c_2$
2. $\cos\theta = \frac{\vec{A} \bullet \vec{B}}{|A||B|}$
3. $|\vec{A}| = \sqrt{x^2 + y^2}$

MATRIX

Inverse Matrix ;

$$A^{-1} = \frac{1}{ad - bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$