

10

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK
KEMENTERIAN PENDIDIKAN MALAYSIA**

JABATAN MATEMATIK, SAINS DAN KOMPUTER

**PEPERIKSAAN AKHIR
SESI DISEMBER 2014**

DBM1032: ELEMENTARY MATHEMATICS

**TARIKH : 09 APRIL 2015
MASA : 11.15 AM - 1.15 PM (2 JAM)**

Kertas ini mengandungi **DUA BELAS (12)** halaman bercetak.

Bahagian A: Struktur (3 soalan)
Bahagian B: Struktur (2 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALANINI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

SECTION A / SEKSYEN A**STRUCTURED (75 marks) / STRUKTUR (75 markah)****INSTRUCTION:**

This section consists of 3 structured questions. Answer **ALL** the questions.

ARAHAN:

*Bahagian ini mengandungi 3 soalan struktur. Jawab **SEMUA** soalan.*

QUESTION 1**SOALAN 1**

- a) Simplify the following to the lowest terms:

Permudahkan soalan di bawah kepada terma terendah:

i. $\frac{2j}{5} + \frac{2j}{10}$

[2 marks]

[2 markah]

ii. $\frac{2(p+3)}{pq} - \frac{3(3-q)}{2q}$

[3 marks]

[3 markah]

iii. $\frac{36r^2u-16r}{24r^2u^2}$

[2 marks]

[2 markah]

iv. $\frac{mx}{a^2-b^2} \div \frac{2x}{a+b}$

[3 marks]

[3 markah]

CLO1
C2

CLO2
C3

- b) Change the subject of the formula in term of s .
Tukarkan subjek bagi formula di bawah dalam sebutan s .

$$2u + v^2 = \sqrt{\frac{s-6t}{3t}}$$

[4 marks]

[4 markah]

CLO2
C3

- c) Solve the following equation by factorization.
Selesaikan persamaan di bawah melalui kaedah pemfaktoran.

$$8f^2 - 6f - 13 = 2f^2 - 4f - 9$$

[5 marks]

[5 markah]

CLO2
C3

- d) Solve the following equation by formula.
Selesaikan persamaan di bawah melalui kaedah formula.

$$\frac{2}{9} + \frac{k}{3} = k^2$$

[6 marks]

[6 markah]

CLO1
C3**QUESTION 2****SOALAN 2**

- a) In the diagram below, JKLM is a trapezium and PMN is a triangle. M and P is the midpoints of LN and JM respectively. Given $LN = 12 \text{ cm}$, $JM = 10 \text{ cm}$, $KL = 7 \text{ cm}$ and $KJ = 8 \text{ cm}$. Calculate the

Dalam rajah di bawah, JKLM ialah sebuah trapezium dan PMN ialah sebuah segitiga. M dan P ialah titik tengah kepada LN dan JM. Diberi LN = 12cm, JM = 10 cm, KL = 7 cm dan KJ = 8 cm. Kira

- i) Total area in cm^2 for the diagram

Jumlah luas rajah dalam cm^2

[6 marks]

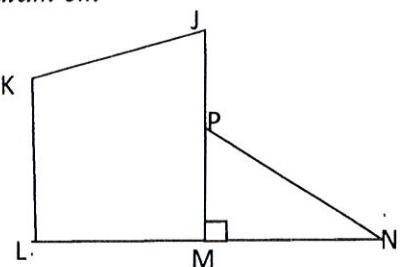
[6 markah]

- ii) Perimeter in cm for the diagram

Perimeter rajah dalam cm

[4 marks]

[4 markah]

CLO2
C3

- b) The diameter of a basketball is 20 cm. Calculate its surface area and volume of the basketball.

[use $\pi=22/7$].

Diameter sebiji bola keranjang ialah 20cm. Kira luas permukaan dan isipadu bola tersebut. [gunakan nilai $\pi=22/7$]

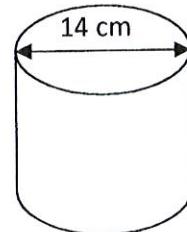
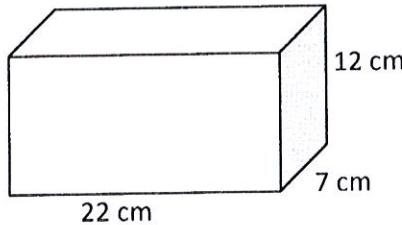
[5 marks]

[5 markah]

CLO2
C3

- c) The diagram below shows a container in the shape of a cuboid and another one in the shape of a cylinder. The cuboid is full of water. All water in the cuboid is poured into the cylindrical container. Calculate the height in cm of the water level in the cylindrical container. [Use $\pi=22/7$].

Dalam rajah di bawah menunjukkan satu bekas berbentuk kuboid dan satu lagi bekas berbentuk silinder. Kuboid diisi penuh dengan air. Semua air di dalam kuboid dituang ke dalam bekas silinder. Kira ketinggian (cm) paras air di dalam bekas silinder. [gunakan nilai $\pi=22/7$]



[4 marks]

[4 markah]

CLO2
C3

- d) Figure 2(d) shows the cross section of a rubber soccer ball of outside diameter 22 cm. The thickness of the rubber is 0.5 cm. What is the volume of the rubber?

Rajah 2(c) menunjukkan keratan rentas bagi bola sepak getah di mana diameter luarnya adalah 22 cm. Ketebalan getah tersebut ialah 0.5 cm. Apakah isipadu bagi getah tersebut?

[6 marks]

[6 markah]

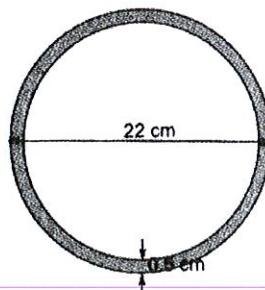


Figure 2(d)/Rajah 2(d)

QUESTION 3
SOALAN 3

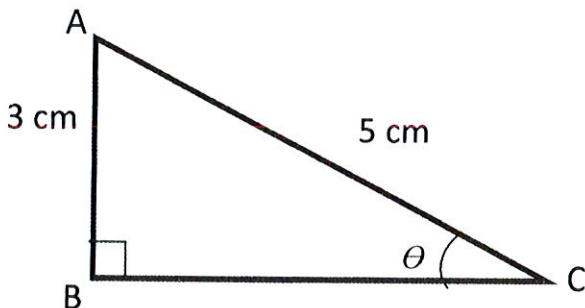


Figure 3 (a)/Rajah 3(a)

CLO1
C2

- (a) From Figure 3 (a), find $\sec \theta$:

Daripada Rajah 3(a), tentukan $\sec \theta$:

[4 marks]

[4 markah]

CLO2
C2

(b)

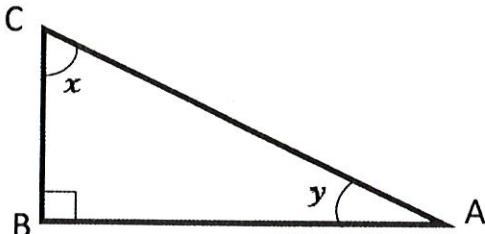


Figure 3 (b)/Rajah 3(b)

In Figure 3 (b), ABC are right angled triangle. Given $AB = 12$ and $BC = 5$. Determine the angle x and y .

Dalam Rajah 3 (b) ABC adalah sebuah segitiga bersudut tepat. Diberi $AB = 12$ and $BC = 5$. Tentukan sudut x dan y .

[4 marks]

[4 markah]

SULITCLO2
C2

(c) Find the value of the trigonometric functions below by using a reference angle.

Cari nilai fungsi trigonometri di bawah dengan menggunakan sudut rujukan.

i. $\sin 200$

[2 marks]

[2 markah]

ii. $\sin -140$

[2 marks]

[2 markah]

CLO2
C3(d) In a different right angled triangle ΔABC , $\sin A = \frac{5}{13}$ and $\cos B = \frac{24}{26}$. Find the value of :Dalam segitiga bersudut tepat yang berasingan ΔABC , $\sin A = \frac{5}{13}$ dan $\cos B = \frac{24}{26}$.

Cari nilai berikut :

i. $\cos A \cos B + \sin A \sin B$

[6 marks]

[6 markah]

ii.
$$\frac{\tan A - \tan B}{1 + \tan A \tan B}$$

[2 marks]

[2 markah]

iii. $\tan^2 A - \sec^2 B$

[2 marks]

[2 markah]

CLO2
C3(e) Given $\sin \frac{\theta}{2} = 0.208$. Find $\cos \theta$ for $0^\circ \leq \theta \leq 360^\circ$.

[3 marks]

Diberi $\sin \frac{\theta}{2} = 0.208$, cari $\cos \theta$ untuk $0^\circ \leq \theta \leq 360^\circ$.

[3 markah]

SECTION B : 25 MARKS**BAHAGIAN B : 25 MARKAH****INSTRUCTION:**

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

ARAHAN:

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

QUESTION 4**SOALAN 4**

- a. Define and sketch a diagram for the following:

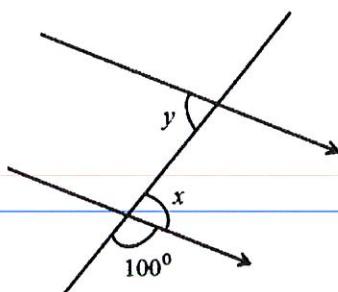
Berikan maksud dan lakarkan rajah bagi yang berikut:

- i. obtuse angle
sudut cakah [2 marks]
[2 markah]
- ii. acute angle
sudut tirus [2 marks]
[2 markah]

- b. Find the value of x and y based on the diagrams below:

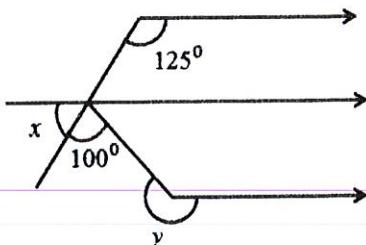
Cari nilai x dan y berdasarkan rajah-rajah dibawah:

i.



[3 marks]
[3 markah]

ii.



[5 marks]
[5 markah]

CLO2
C3

- c. ABC is a tangent to the circle with centre O at B. ADO and EOF are straight lines.

Find the value of:

ABC ialah tangen pada bulatan yang berpusat di O pada B. ADO dan EOF adalah garis lurus. Cari nilai bagi:

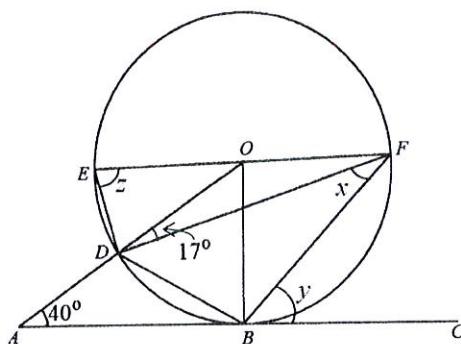


Figure 4 (a)/Rajah 4 (a)

i. x

[5 marks]
[5 markah]

ii. y

[4 marks]
[4 markah]

iii. z

[4 marks]
[4 markah]

QUESTION 5**SOALAN 5**CLO 1
C2

- a) Convert each of the following angles in:

Tukarkan sudut berikut:

- i. degrees to radians

325.8°

[2 marks]

[2 markah]

- ii. radians to degrees

2.69 rad

[2 marks]

[2 markah]

CLO 2
C2

- b) The Figure 5(b) shows a wooden frame that is to be part of the roof of a house:

Rajah 5(b) menunjukkan bingkai kayu yang menjadi sebahagian daripada bumbung sebuah rumah:

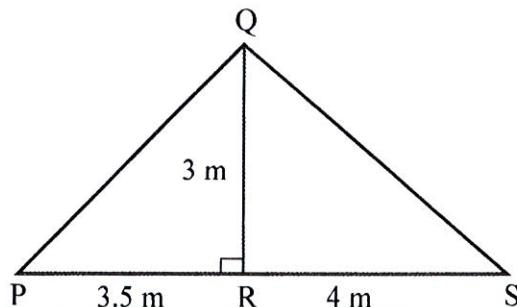


Figure 5(b) / Rajah 5(b)

- i. Calculate the length PQ

[3 marks]

Kirakan panjang PQ

[3 markah]

- ii. Calculate the length QS

[3 marks]

Kirakan panjang QS

[3 markah]

- iii. Calculate the perimeter of the wooden frame.

[2 marks]

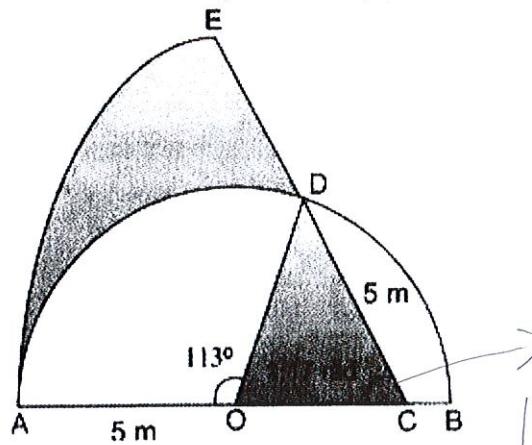
Kirakan perimeter bingkai kayu tersebut.

[2 markah]

CLO 2
C3

- c) Figure 5(c) shows a semicircle ADB with a centre at O and has a radius of 5 m. ACE is a sector of a circle with the centre at C and has a radius of 8.8 m. Given CE intersects the semicircle at D such that $CD = 5$ m. Calculate:

Rajah 5(c) menunjukkan semibulatan ADB berpusat O dan mempunyai jejari 5 m. ACE adalah sebuah sektor bulatan berpusat C berjejari 8.8 m. Di beri, panjang CD = 5 m. Kirakan:



1.17 rad

Figure 5(c) / Rajah 5(c)

- i. $\angle AOD$, in radians

$\angle AOD$, di dalam radians

[2 marks]

[2 markah]

- ii. the perimeter of the shaded region ADE

perimeter kawasan berlorek ADE

[6 marks]

[6 markah]

- iii. the area of the shaded region

luas kawasan berlorek

[5 marks]

[5 markah]

SOALAN TAMAT

FORMULA SHEET FOR ELEMENTARY MATHEMATICS (DBM1032)

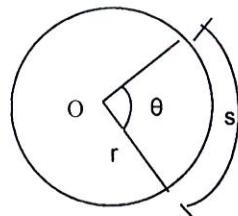
SOLVING QUADRATIC EQUATION

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

MEASUREMENT

Arc Length of a Circle

$$s = r\theta$$



Area of a Sector

$$A = \frac{1}{2}r^2\theta$$

Area of triangle

$$A = \frac{1}{2}r^2 \sin \theta$$

Area of a Segment

$$A = \frac{1}{2}r^2\theta - \frac{1}{2}r^2 \sin \theta$$

SURFACE AREA AND VOLUME

Cylinder : $A = 2\pi rh + 2\pi r^2$

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

Cone : $A = \pi rs + \pi r^2$

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

Sphere : $A = 4\pi r^2$

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

Pyramid : $A = \text{area of four triangles} + \text{area of base}$

$$V = (1/3) \times (\text{area of base}) \times (\text{height})$$

Cuboid : $A = 2(wh + lw + lh)$

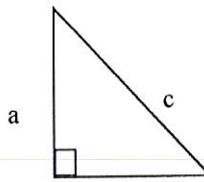
$$V = lwh$$

Prism : $A = \text{Area of 3 rectangular faces} + \text{Area of 2 triangular faces}$

$$V = A \times l$$

TRIGONOMETRY

Pythagoras' Theorem



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

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

AREA

Equilateral Triangle: $A = \frac{\sqrt{3}}{4}s^2$

