

SULIT



**BAHAGIAN PEPERIKSAAN DAN PENILAIAN
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI
KEMENTERIAN PENGAJIAN TINGGI**

JABATAN MATEMATIK, SAINS & KOMPUTER

PEPERIKSAAN AKHIR

SESI II : 2021 / 2022

DBM10133: MATHEMATICS FOR TECHNOLOGY

TARIKH : 27 JUN 2022

MASA : 8.30 PAGI – 10.30 PAGI (2 JAM)

Kertas ini mengandungi **SEMBILAN (9)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

SULIT

INSTRUCTION:

This section consists of **FOUR (4)** structured questions. Answer **ALL** question.

ARAHAN:

Bahagian ini mengandungi EMPAT (4) soalan berstruktur. Jawab SEMUA soalan.

QUESTION 1**SOALAN 1**

CLO 1
C3

- a) Solve the following algebraic expressions in the simplest form.
Selesaikan ungkapan algebra berikut dalam bentuk termudah.

i)
$$\frac{3m-3n}{4b} \times \frac{8a}{km-kn}$$

[4 marks]

[4 markah]

ii)
$$\left(u^2 - uv\right) \times \frac{w}{uv}$$

[3 marks]

[3 markah]

CLO 1
C3

- b) Based on the following formula, use the letter indicated as the subject.
Berdasarkan formula berikut, gunakan huruf seperti yang ditunjukkan sebagai subjek.

i) $4(g-w) = 5w-3$; (w)

[4 marks]

[4 markah]

ii) $y = \frac{x+3}{x-8}$; (x)

[4 marks]

[4 markah]

CLO 1
C3

- c) Solve the following simultaneous equation using substitution method.
Selesaikan persamaan serentak berikut menggunakan kaedah penggantian.

$$\begin{aligned} 4c + 2b &= 9 \\ -3c + 3b &= 3 \end{aligned}$$

[10 marks]

[10 markah]

QUESTION 2

SOALAN 2

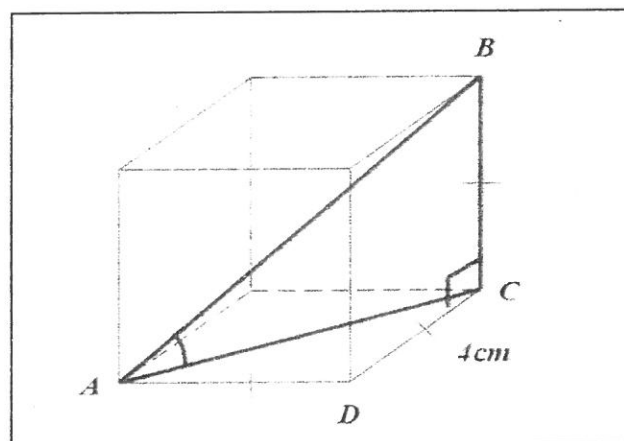


Diagram 2(a)(i) / Rajah 2(a)(i)

CLO 1
C3

- a) Diagram 2(a)(i) shows a cube with 4cm sides. $\angle ADC$ is 90° and triangle ABC is the diagonal plane of the cube.

Rajah 2(a)(i) menunjukkan sebuah kubus dengan sisi 4cm. $\angle ADC$ adalah 90° dan segitiga ABC adalah satah pada pepenjuru kubus.

- i. Calculate the length of AC

[3 marks]

Kira panjang AC

[3 markah]

- ii. Find sine $\angle BAC$

[4 marks]

Dapatkan $\sin \angle BAC$

[4 markah]

CLO 1
C3

- b) i. Based on Diagram 2(b)(i) below, solve the values of
- x
- and
- y
- .

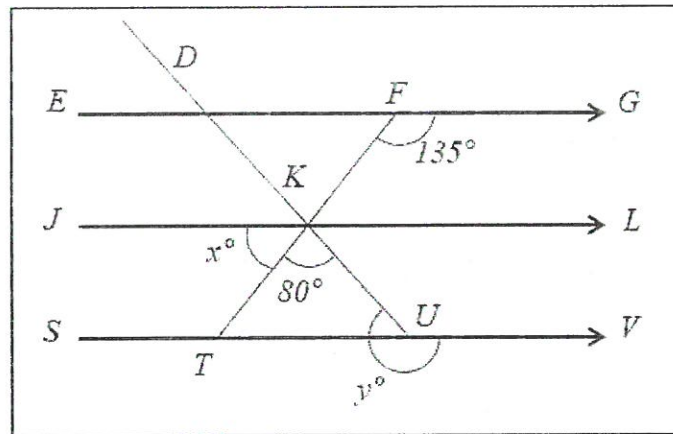
Berdasarkan Rajah 2(b)(i) di bawah, selesaikan nilai-nilai x dan y 

Diagram 2(b)(i) / Rajah 2(b)(i)

[4 marks]

[4 markah]

CLO 1
C3

- ii) Compute the value of
- x
- in Diagram 2(b)(ii).

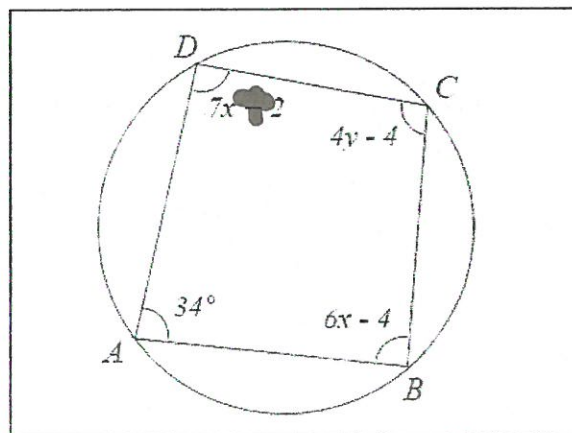
Kirakan nilai x dalam Rajah 2(b)ii.

Diagram 2(b)(ii) / Rajah 2(b)(ii)

[4 marks]

[4 markah]

c)

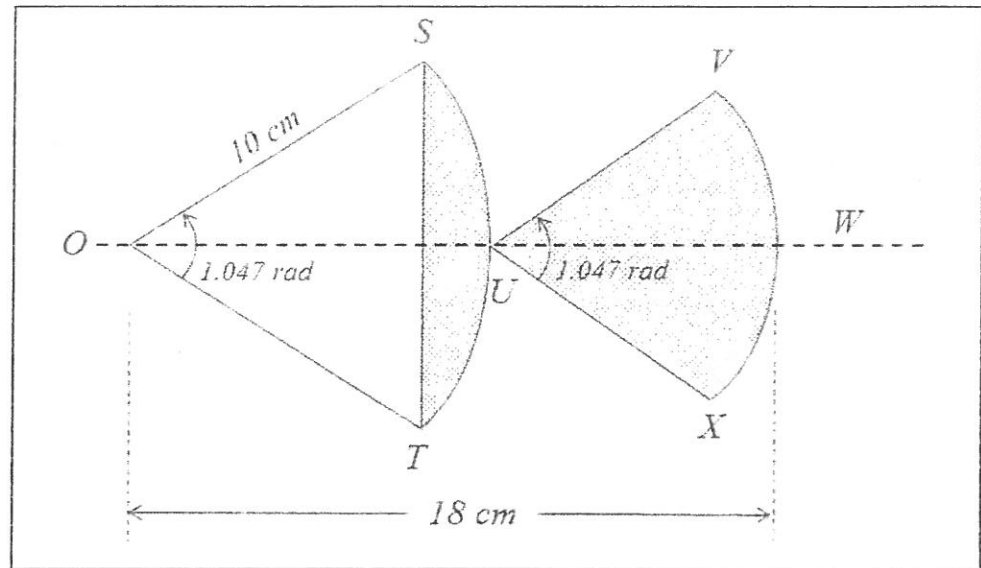
CLO 1
C3

Diagram 2(c) / Rajah 2(c)

Diagram 2(c) shows a sketch design with a symmetry axis, OW . Given that SUT and VWX are arcs with center O and U respectively. Calculate the total area of the shaded region ($STU + UVWX$).

Rajah 2(c) menunjukkan satu rekabentuk lakaran dengan paksi simetri, OW . Diberi bahawa SUT dan VWX adalah lengkok dengan masing-masing berpusat di O dan U . Kirakan jumlah luas kawasan berlorek ($STU + UVWX$).

[10 marks]

[10 markah]

QUESTION 3

SOALAN 3

Question 3(a) and 3(b) are based on Diagram 3(a) below.

Soalan 3a dan 3b hendaklah berdasarkan Rajah 3a di bawah.

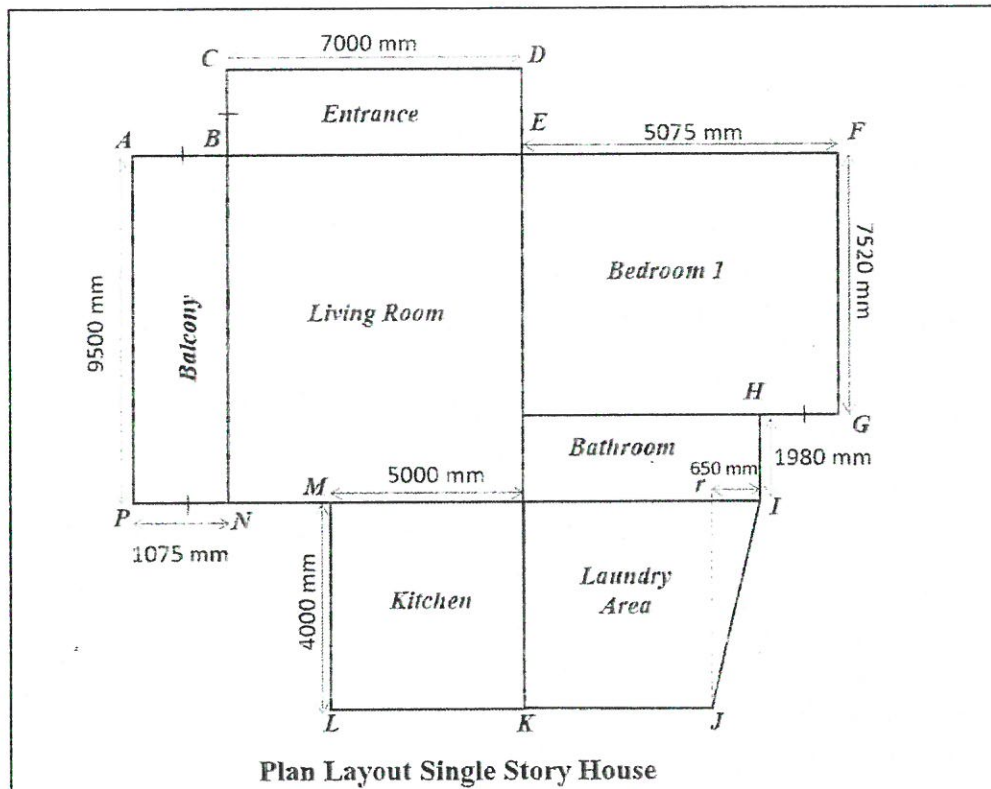


Diagram 3(a) / Rajah 3(a)

CLO 1
C3

- a) Calculate the perimeter of the single story house. Final answer should be in meter.
Hitung perimeter bagi rumah 1 tingkat tersebut. Jawapan akhir mestilah di dalam unit meter.

[7 marks]

[7 markah]

CLO 1
C3

- b) Calculate the area of the kitchen, bedroom 1, laundry area and living room. Final answer should be in meter square.
Kirakan keluasan untuk dapur, bilik tidur 1, ruang dobi dan ruang tamu. Jawapan akhir mestilah di dalam meter persegi.

[8 marks]

[8 markah]

CLO 1
C3

- c) Raju has a concrete block as shown in Diagram 3(c). A cylinder has been drilled out of the block. Calculate;

Raju mempunyai sebuah blok konkrit seperti yang ditunjukkan pada Diagram 3(c). Satu lubang silinder telah di ditebuk melalui blok tersebut. Hitung;

- i) Surface area of the cylinder
Kawasan permukaan silinder

[3 marks]

[3 markah]

- ii) The remaining volume of the block
Jumlah isipadu blok yang tinggal

[7 marks]

[7 markah]

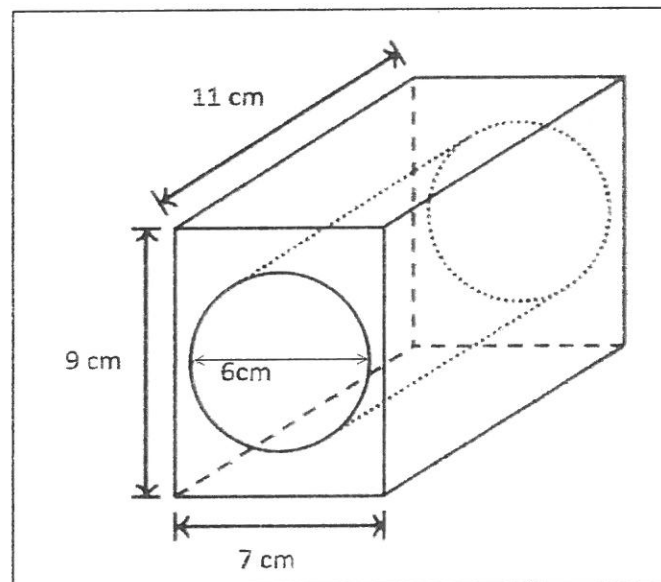


Diagram 3(c)

Rajah 3(c)

QUESTION 4

SOALAN 4

CLO 1
C3

- a) Diagram 4 shows straight line AB at Cartesian plane.
Rajah 4 menunjukkan garis lurus pada satah Cartesian.

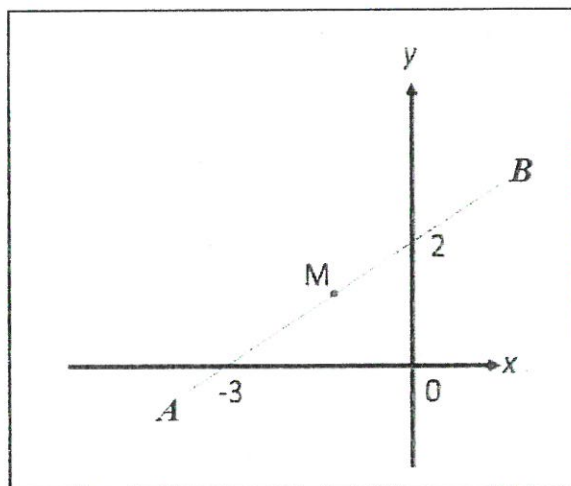


Diagram 4 / Rajah 4

- i) Find the straight line equation for AB

Cari ungkapan garis lurus AB

[4 marks]

[4 markah]

- ii) Find the midpoint M.

Cari titik tengah M

[3 marks]

[3 markah]

CLO 1
C3

- b) Construct a quadratic graph for equation $y = 2x^2 - x$ in the range of $-1 \leq x \leq 1$.

Bina graf kuadratik untuk persamaan $y = 2x^2 - x$ dalam julat $-1 \leq x \leq 1$.

[8 marks]

[8 markah]

CLO 1
C3

- c) Demonstrate the intersection points from the following simultaneous equation using graphical method in the range of $-5 \leq x \leq 1$.

Tunjukkan titik persilangan dari persamaan serentak berikut dengan menggunakan kaedah graf dalam julat $-5 \leq x \leq 1$.

$$y = x^2 - 4x + 3$$

$$2y + x = 6$$

[10 marks]

[10 markah]

SOALAN TAMAT

FORMULA TABLE
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Trigonometric Functions

$$\sin \theta = \frac{\text{Opposite}}{\text{Hypotenuse}}$$

$$\cos \theta = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

$$\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$$

Graph: Linear Functions

$$y = mx + c$$

Mid point

$$\left[\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right]$$

Distance

$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Area of Sector

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

Area of Segment

$$\frac{1}{2} \times r^2 \times (\theta - \sin \theta)$$

Length of arc

$$s = r \theta$$

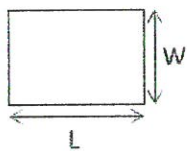
Radian to degree

$$\text{Radian} = \frac{180^\circ}{\pi}$$

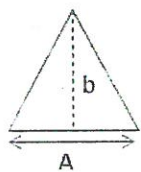
Pythagoras' Theorem

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

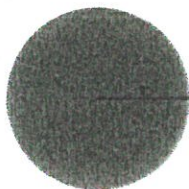
Formula Area



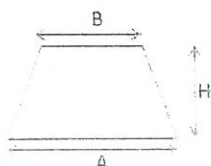
$$L \times W$$



$$\frac{1}{2} \times A \times b$$

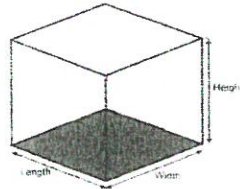


$$\pi r^2$$

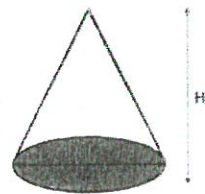


$$\left(\frac{A+B}{2} \right) \times H$$

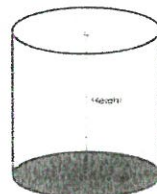
Formula Volume



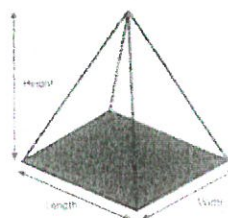
$$L \times W \times H$$



$$\frac{1}{3} \pi r^2 H$$



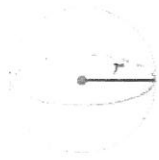
$$\pi r^2 H$$



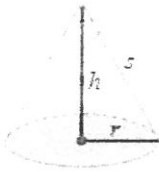
$$\frac{1}{3} L \times W \times H$$

FORMULA TABLE
DBM10133: BASIC MATHEMATICS FOR TECHNOLOGY

Formula Surface Area



$$4\pi r^2$$



$$\pi r^2 + \pi r s$$

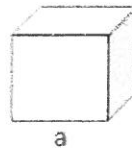


$$A_{\text{Base}} = s^2$$

$$A_{\text{Triangle}} = \frac{s l}{2}$$

$$A_{\text{Total}} = A_{\text{Base}} + 4 A_{\text{Triangle}}$$

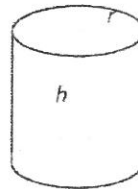
$$A_{\text{Total}} = s^2 + 2 s l$$



$$6 a^2$$



$$2(h \times l) + 2(h \times w) + 2(l \times w)$$



$$2\pi r h$$

