SULIT

KEMENTERIAN PENDIDIKAN TINGGI
JABATAN PENDIDIKAN POLITEKNIK DAN KOLEJ KOMUNITI

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

JABATAN MATEMATIK, SAINS DAN KOMPUTER

PEPERIKSAAN AKHIR

SESI I : 2025/2026

DBM10133: MATHEMATICS FOR TECHNOLOGY

TARIKH : 08 DISEMBER 2025
MASA : 8.30 PAGI – 10.30 PAGI (2 JAM)

Kertas ini mengandungi **SEBELAS (11)** halaman bercetak.

Struktur (4 soalan)

Dokumen sokongan yang disertakan : Formula

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIARAHKAN

(CLO yang tertera hanya sebagai rujukan)

INSTRUCTION

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

ARAHAN

*Bahagian ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab semua soalan.*

QUESTION 1

SOALAN 1

CLO1 (a) Express each of the following algebraic expressions in the simplest form.

Ungkapkan persamaan algebra berikut dalam bentuk termudah.

i. $\dfrac{15x^2y^4\mathrm{z}}{-3xy^2\mathrm{z}}$

[3 marks]
[*3 markah*]

ii. $\dfrac{-5x}{7y} \div \dfrac{15x^3y}{21y^3}$

[4 marks]
[*4 markah*]

CLO1 (b) Express the following equations so that ***T*** will be the subject of formula.

*Ungkapkan semula persamaan berikut supaya **T** menjadi perkara rumus.*

i. $5M = 2\mathrm{b} - 3T^2$

[3 marks]
[*3 markah*]

ii. $Z + 3 = \dfrac{4T-12}{T+5}$

[5 marks]
[*5 markah*]

CLO1 (c) Solve the following simultaneous equation.

Selesaikan persamaan serentak berikut.

$$3x + 4y = 5$$

$$2x - 3y = 9$$

[10 marks]

[*10 markah*]

QUESTION 2

SOALAN 2

CLO1

(a) Figure 2(a) shows the location of three Politeknik. Politeknik Sultan Haji Ahmad Shah (POLISAS) is 312km due East of Politeknik Nilai (PNS). Politeknik Seberang Perai (PSP) is 405km due North of Politeknik Nilai (PNS). Calculate:

Rajah 2(a) menunjukkan lokasi 3 buah politeknik. Politeknik Sultan Haji Ahmad Shah (POLISAS) terletak 312km ke timur Politeknik Nilai (PNS). Politeknik Seberang Perai (PSP) terletak 405km ke utara Politeknik Nilai (PNS). Hitung:

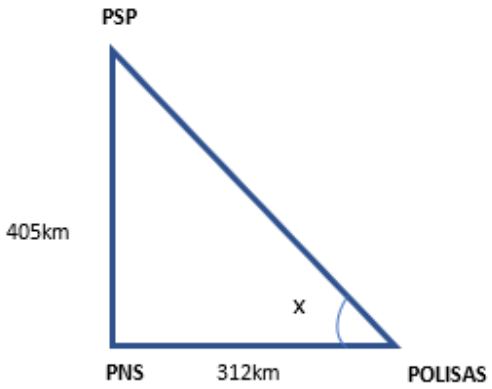


Figure 2(a) / *Rajah 2(a)*

i. Distance between PSP and POLISAS. Give your answer correct to the nearest kilometre.

Jarak antara PSP dan POLISAS. Berikan jawapan dalam kilometer terdekat.

[4 marks]

[*4 markah*]

ii. The value x in degree.

Nilai x dalam darjah.

[3 marks]

[*3 markah*]

CLO1

(b) i. Based on Figure 2(b) below, AB is parallel to CD. Calculate the value of z.

Berdasarkan Rajah 2(b) di bawah, AB selari dengan CD. Hitungkan nilai z.

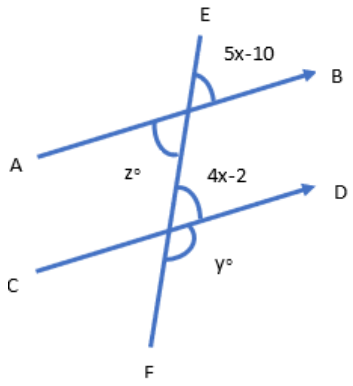


Figure 2(b) / *Rajah 2(b)*

[4 marks]

[4 *markah*]

ii. Based on Figure 2 (c), the circle below has centre O. The diameter BD is perpendicular to the chord AC at point E. Given line CE is 5.4cm and line AB is 8.1cm. Calculate the length of the line BE. Write your answer to one decimal place.

Berdasarkan Rajah 2(c),bulatan di bawah mempunyai pusat bulatan O. Diameter BD adalah berserenjang dengan kord AC di titik E. Diberi panjang garis CE ialah 5.4cm dan panjang garis AB ialah 8.1cm. Hitung panjang garis BE. Tulis jawapan anda kepada satu tempat perpuluhan.

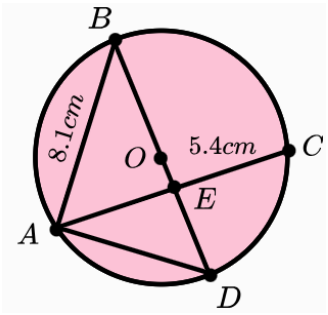


Figure 2(c) / *Rajah 2(c)*

[4 marks]

[*4 markah]*

CLO1 (c) Figure 2(d) below shows a rectangle ABCD and a semi-circle. BE is the radius of a semi-circle. Given that $\angle CEF = 55°$ and $\pi = 3.142$. Calculate:

Rajah 2(d) di bawah menunjukkan sebuah segi empat tepat ABCD dan sebuah separa bulatan . BE adalah jejari sebuah separa bulatan. Diberi sudut $\angle CEF = 55°$ *dan* $\pi = 3.142$. *Kirakan:*

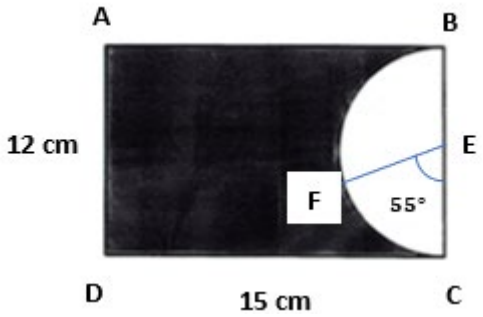


Figure 2(d) / *Rajah 2(d)*

i. Arc length BC.
Panjang lengkok BC.

[2 marks]
[*2 markah*]

ii. Area of sector CEF.
Luas sektor CEF.

[3 marks]
[*3 markah*]

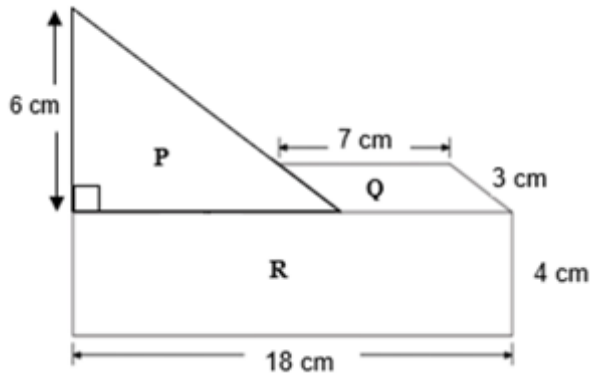
iii. The area, in cm^2, of the shaded region.
Luas dalam unit cm^2*, bagi kawasan berlorek.*

[5 marks]
[*5 markah*]

QUESTION 3

SOALAN 3

CLO1 (a) Figure 3(a) shows a right angle triangle P, a parallelogram Q and a rectangle R.
Rajah 3(a) menunjukkan sebuah segi tiga bersudut tegak P, sebuah segi empat selari Q dan sebuah segi empat tepat R.



Rajah 3(a) / *Figure 3(a)*

i. Calculate the area of right angle triangle **P**.
*Kira luas segitiga bersudut tegak **P**.*

[3 marks]
[*3 markah*]

ii. Calculate perimeter in cm, of the whole figure.
Kira perimeter dalam cm, keseluruhan rajah tersebut.

[4 marks]
[*4 markah*]

CLO1

(b) Figure 3(b) shows a prism with a based width of 8 cm, length 10 cm, height of 6 cm and slant 6 cm.

Rajah 3(b) menunjukkan sebuah prisma dengan lebar dasar 8 cm, panjang 10 cm, tinggi 6 cm dan panjang sendeng 6 cm.

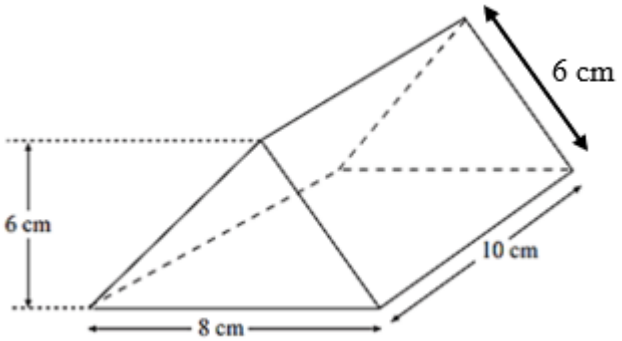


Figure 3(b) / *Rajah 3(b)*

i. Calculate the surface area of the prism.

Kira luas permukaan prisma.

[4 marks]

[*4 markah*]

ii. Calculate the volume of the prism.

Kira isipadu prisma.

[4 marks]

[*4 markah*]

CLO1 (c) Figure 3(c) shows a wooden block that has a combination of two cuboid.
Rajah 3(c) menunjukkan sebuah blok kayu yang mempunyai gabungan dua kuboid.

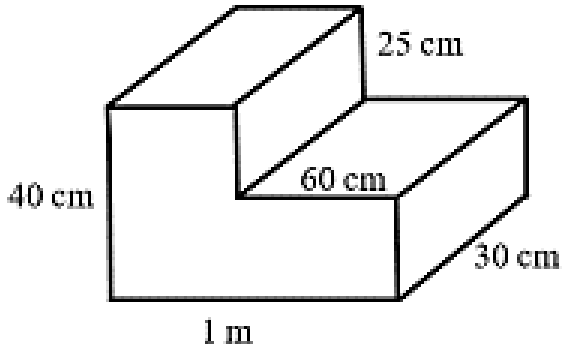


Figure 3(c) / *Rajah 3(c)*

i. Calculate the volume of the wooden block.
Kira isipadu blok kayu tersebut.

[5 marks]
[*5 markah*]

ii. Calculate the surface area of the wooden block.
Kira luas permukaan blok kayu tersebut.

[5 marks]
[*5 markah*]

QUESTION 4

SOALAN 4

CLO1 (a) Given point $A\ (-4,3)$ and point $B\ (2,-6)$. Calculate:

Diberi titik $A\ (-4,3)$ *and titik* $B\ (2,-6)$. *Kira:*

i. Midpoint of point A and B.

Titik tengah bagi titik A dan B.

[4 marks]

[*4 markah*]

ii. The distance between point A and B.

Jarak di antara titik A dan B.

[3 marks]

[*3 markah*]

CLO1 (b) Complete the table below for $y = 2x^2 - 4x + 3$.

Lengkapkan jadual di bawah bagi $y = 2x^2 - 4x + 3$.

i.

x	-4	-3	-2	-1	0	1	2	3
$y = 2x^2 - 4x + 3$	43	27	15		3		7	

[3 marks]

[*3 markah*]

ii. Based on information in b(i), draw the graph for $y = 2x^2 - 4x + 3$.

Berdasarkan maklumat pada b(i), lukiskan graf bagi $y = 2x^2 - 4x + 3$.

[5 marks]

[*5 markah*]

CLO1

(c) i. Given $y = 2x - 7$ and $y = -x + 6$. Construct table of values for $y = 2x - 7$ and $y = -x + 6$.
Diberi $y = 2x - 7$ *dan* $y = -x + 6$. *Bina jadual nilai bagi* $y = 2x - 7$ *dan* $y = -x + 6$.

[2 marks]
[*2 markah*]

ii. Based on information in c(i), draw both functions on the same graph paper.
Berdasarkan maklumat pada c(i), lukiskan kedua-dua fungsi pada kertas graf yang sama.

[6 marks]
[*6 markah*]

iii. Based on your graphs in c(ii), show the intersection point.
Berdasarkan graf pada c(ii), tunjukkan titik persilangan.

[2 marks]
[*2 markah*]

SOALAN TAMAT

FORMULAE TABLE
DBM 10133 MATHEMATICS FOR TECHNOLOGY

Phythagoras Theorem

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

Trigonometric Functions

$$\sin\theta = \frac{opposite}{hypotenuse} \quad \text{SOH}$$

$$\cos\theta = \frac{adjacent}{hypotenuse} \quad \text{CAH}$$

$$\tan\theta = \frac{opposite}{adjacent} \quad \text{TOA}$$

Radian to Degree

$$\theta° = value\ in\ radian \times \frac{180°}{\pi}$$

Degree to Radian

$$\theta_{rad} = value\ in\ degree \times \frac{\pi}{180°}$$

Arc Length

$s = r\theta$ if θ in radian

$s = \frac{\theta}{360°}\pi d$ if θ in degree

Area of Sector

$Area\ of\ sector = \frac{1}{2}r^2\theta$ if θ in radian

$Area\ of\ sector = \frac{\theta}{360°}\pi r^2$ if θ in degree

Area of Segment

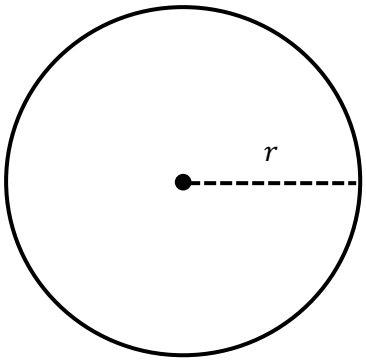
$$Area\ of\ segment = \frac{1}{2}r^2(\theta_1 - \sin\theta_2)$$

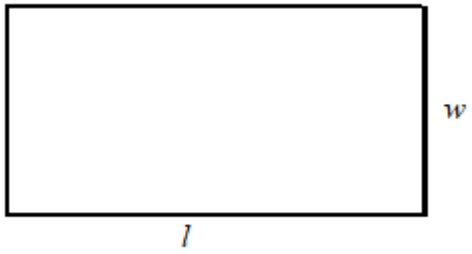
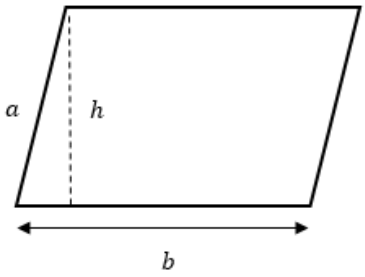
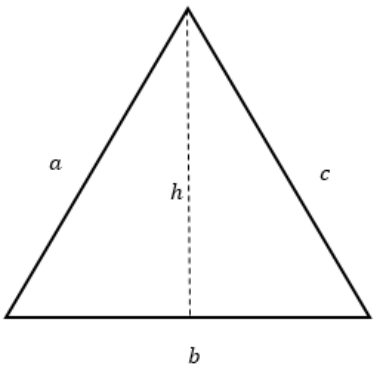
θ_1 must be in radian
θ_2 must be in degree

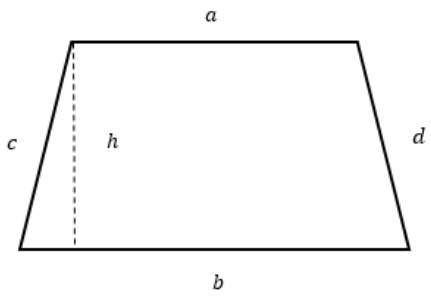
$$Area\ of\ segment = \frac{1}{2}r^2\left[\left(\theta \times \frac{\pi}{180^\circ}\right) - \sin\theta\right]$$

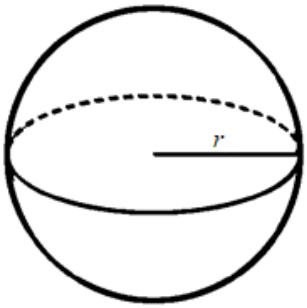
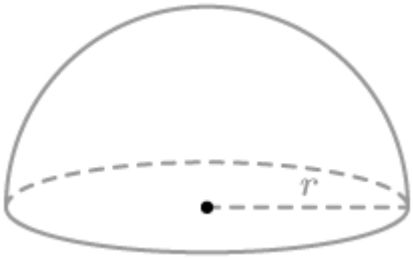
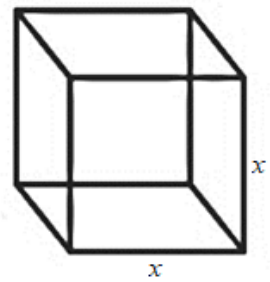
θ must be in degree

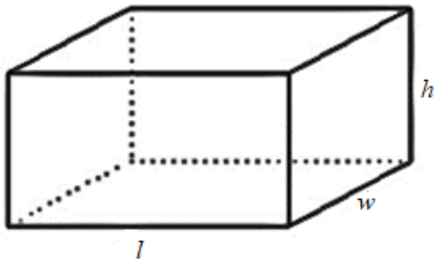
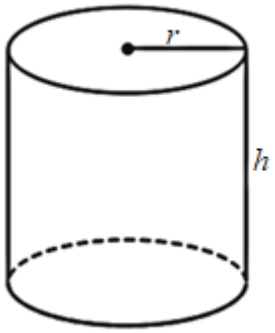
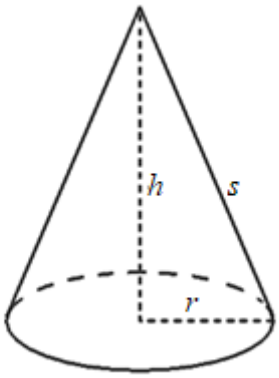
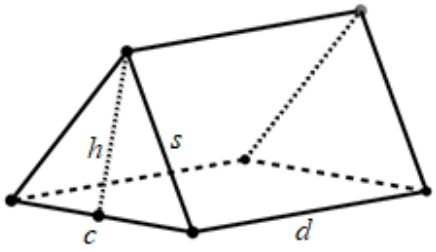
Linear	$y = mx + c$
Quadratic	$y = ax^2 + bx + c$
Gradient / Slope	$m = \frac{y_2 - y_1}{x_2 - x_1}$
Midpoint	$\left(x_{mid} = \frac{x_1 + x_2}{2}, y_{mid} = \frac{y_1 + y_2}{2}\right)$
Distance	$AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Vertex	$Vertex\ point = (h, k)$ $\left(h = \frac{-b}{2a}, k = f(h)\right)$
Intersection Point	$y_1 = y_2$

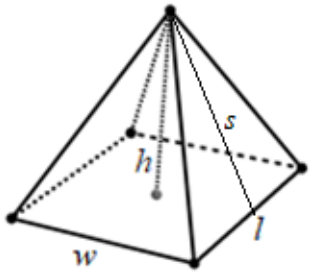
Shape	Circumference	Area
	$2\pi r$	πr^2

Shape	Perimeter	Area
Rectangle 	$P = 2l + 2w$	$A = l \times w$
Parallelogram 	$P = 2(a + b)$	$A = b \times h$
Triangle 	$P = a + b + c$	$A = \frac{1}{2} \times b \times h$

Trapezium / Trapezoid 	$P = a + b + c + d$	$A = \left(\frac{a+b}{2}\right) \times h$

Shape	Surface Area	Volume
Sphere 	$SA = 4\pi r^2$	$V = \frac{4}{3}\pi r^3$
Hemisphere 	$SA = 2\pi r^2 + \pi r^2$ **Or** $SA = 3\pi r^2$	$V = \frac{2}{3}\pi r^3$
Cube 	$SA = 6x^2$ where x is the edge of the cube	$V = x^3$ where x is the edge of the cube

Cuboid 	$SA = 2(lw + wh + lh)$	$V = lwh$ Where l = length, w = width, h = height of the cuboid
Cylinder 	$SA = 2\pi r^2 + 2\pi rh$	$V = \pi r^2 h$
Cone 	$SA = \pi rs + \pi r^2$	$V = \frac{1}{3}\pi r^2 h$
Prism 	$SA = ch + cd + 2sd$	$V = \frac{1}{2}ch \times d$

Pyramid  	$SA = wl + 2ls$	$V = \frac{1}{3}wl \times h$