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 & KOMPUTER

PEPERIKSAAN AKHIR

SESI I : 2025/2026

DBM10213 : 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 question paper consists of **FOUR (4)** structured questions. Answer **ALL** questions.

ARAHAN:

*Kertas soalan ini mengandungi **EMPAT (4)** soalan berstruktur. Jawab **SEMUA** soalan.*

QUESTION 1

SOALAN 1

CLO1 (a) Simplify the following algebraic expressions in the simplest form.

Ringkaskan ungkapan algebra berikut dalam bentuk termudah.

(i) $\frac{m}{3} \div \frac{m^2}{15n}$

[4 marks]

[4 *markah*]

(ii) $\frac{2x^2y}{15} \times \frac{5}{6xy^2}$

[3 marks]

[*3 markah*]

CLO1 (b) Based on the following equations, convert the variable in bracket as the subject.

Berdasarkan persamaan berikut, tukar pembolehubah di dalam kurungan sebagai subjek.

(i) $\frac{m-3}{n-3m} = \frac{1}{2}$; (m)

[4 marks]

[*4 markah*]

(ii) $p = \frac{7-n}{2n}$; (n)

[4 marks]

[*4 markah*]

CLO1 (c) Solve the following simultaneous equations using the elimination method.

Selesaikan persamaan serentak berikut menggunakan kaedah penghapusan.

$$3x + 4y = 5$$
$$5x - 6y = 2$$

[10 marks]

[*10 markah*]

QUESTION 2

SOALAN 2

CLO1 (a) Figure 2(a) shows that ABC is a straight line, calculate:

Rajah 2(a) di bawah menunjukkan ABC adalah garis lurus, kira:

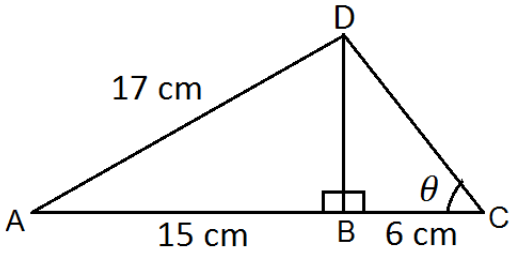


Figure 2(a) / *Rajah 2(a)*

(i) the length of BD.

ukuran panjang BD.

[4 marks]

[*4 markah*]

(i) the value of θ.

nilai θ.

[3 marks]

[3 *markah*]

CLO 1 (b) (i) Figure 2(b)(i) shows that PQ and RS are straight lines. Calculate the values of x and y.

Rajah 2(b)(i) menunjukkan PQ dan RS adalah garis lurus. Kira nilai x dan y.

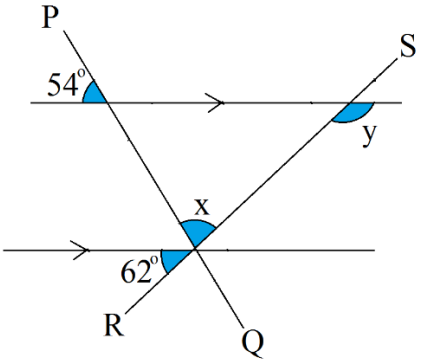


Figure 2(b)(i) / *Rajah 2(b)(i)*

[4 marks]

[*4 markah*]

(ii) Figure 2(b)(ii) shows that points A, B, C, and D are on the circumference of a circle with the centre O. Calculate the values of x and y.

Rajah 2(b)(ii) menunjukkan PQ dan RS adalah garis lurus. Kira nilai x dan y.

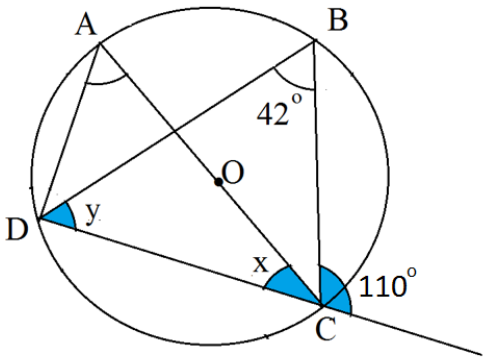


Figure 2(b)(ii) / *Rajah 2(b)(ii)*

[4 marks]

[*4 markah*]

CLO 1

(c) Figure 2(c) shows sectors OPQ and ORS, both with center O. Given that ∠ROS=50°, OQ = 12 cm and QS = 5 cm.

Rajah 2(c) menunjukkan sektor OPQ dan ORS, kedua-duanya berpusat di O. Diberi bahawa ∠ROS = 50°, OQ = 12 cm dan QS = 5 cm.

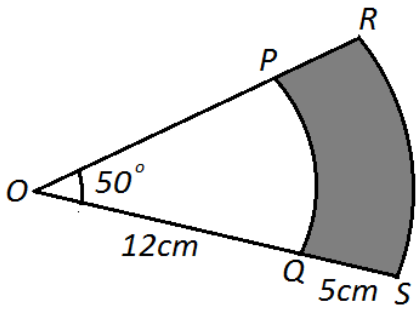


Figure 2(c) / *Rajah 2(c)*

(i) Calculate 50° to radians.

Kira 50° kepada radian.

[3 marks]

[*3 markah*]

(ii) Calculate the arc length of PQ. (Use $\pi = 3.142$)

Hitungkan panjang lengkok PQ. (Nilai π = 3.142)

[3 marks]

[*3 markah*]

(iii) Calculate the area of the shaded region. (Use $\pi = 3.142$).

Hitungkan luas kawasan berlorek. (Nilai π = 3.142).

[4 marks]

[4 *markah*]

QUESTION 3

SOALAN 3

CLO1 (a) Figure 3(a) shows that ABCD is a trapezium and DEFG is a rectangle. Calculate:
Rajah 3(a) menunjukkan ABCD ialah sebuah trapezium dan DEFG ialah sebuah segi empat tepat. Hitungkan:

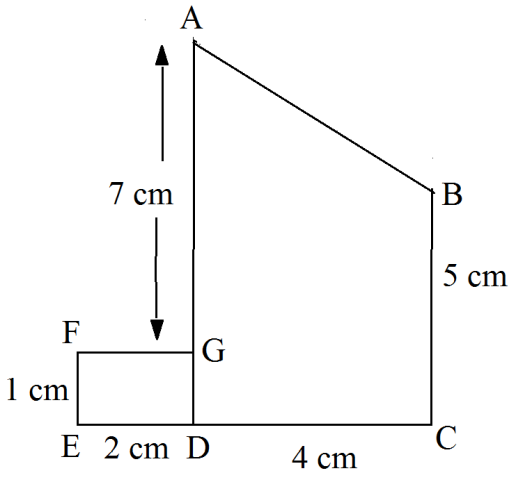


Figure 3(a) / *Rajah 3(a)*

(i) the perimeter of the whole figure in cm.
perimeter bagi keseluruhan rajah dalam cm.

[3 marks]
[3 *markah*]

(ii) the total area of the figure.
jumlah luas bagi keseluruhan rajah.

[4 marks]
[4 markah]

CLO1 (b) Figure 3(b) shows a cylinder with a radius of 5cm and a height of 10cm. Calculate:

Rajah 3(b) menunjukkan sebuah silinder dengan jejari ialah 5cm dan tinggi ialah 10cm. Kirakan:

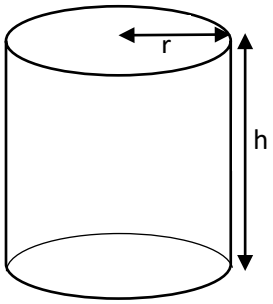


Figure 3(b) / *Rajah 3(b)*

(i) the volume of the cylinder
isipadu silinder

[4 marks]
[*4 markah*]

(ii) the surface area of the cylinder
luas permukaan silinder

[4 marks]
[*4 markah*]

CLO1 (c) Figure 3(c) shows a glass sculpture in the shape of a square-based pyramid.
Rajah 3(c) adalah sebuah arca kaca dalam bentuk piramid berasaskan segi empat sama.

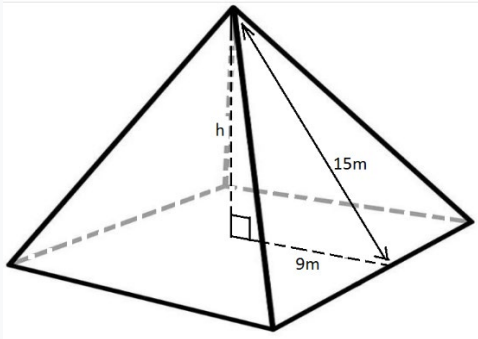


Figure 3(c) / *Rajah 3(c)*

(i) Calculate the value of h.
Kirakan nilai h.

[6 marks]
[*6 markah*]

(ii) Calculate the volume of the glass sculpture.
Kirakan isipadu arca kaca.

[4 marks]
[*4 markah*]

QUESTION 4

SOALAN 4

CLO1 (a) Figure 4(a) shows the straight-line AB on a Cartesian plane. Calculate:

Rajah 4(a) menunjukkan garis lurus AB pada satah Kartesian. Hitungkan:

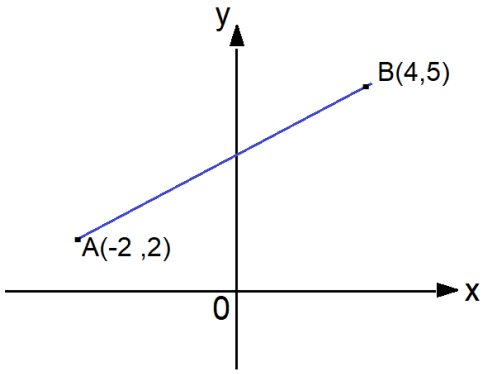


Figure 4(a) / *Rajah 4(a)*

(i) the gradient of points A and B.

kecerunan bagi titik A dan B.

[3 marks]

[*3 markah*]

(ii) the distance between A and B.

jarak antara A dan B.

[4 marks]

[*4 markah*]

CLO1

(b) Given a quadratic function $y = x^2 + 3x - 2$.

Diberi fungsi kuadratik $y = x^2 + 3x - 2$.

i. Complete a table of values for the function $y = x^2 + 3x - 2$ for $-4 \leq x \leq 1$, in Table 4(b)(i).

Lengkapkan jadual nilai bagi fungsi $y = x^2 + 3x - 2$ for $-4 \leq x \leq 1$, *dalam Jadual 4(b)(i).*

Table 4(b)(i) / *Jadual 4(b)(i)*

x	-4	-3	-2	-1	0	1
$y = x^2 + 3x - 2$	2				-2	

[4 marks]

[*4 markah*]

ii. Draw the graph of the function $y = x^2 + 3x - 2$ for $-4 \leq x \leq 1$.

Lukiskan graf bagi fungsi $y = x^2 + 3x - 2$ *for* $-4 \leq x \leq 1$.

[4 marks]

[*4 markah*]

(c) (i) Complete the Table 4(c)(i) for the functions $y = 6 - x$ and $y = \frac{x}{2} + 3$.

Lengkapkan Jadual 4(c)(i) bagi fungsi $= 6 - x$ *and* $y = \frac{x}{2} + 3$.

Table 4(c)(i) / *Jadual 4(c)(i)*

x	-2	2
$y = 6 - x$		

x	-6	4
$y = \frac{x}{2} + 3$		

[4 marks]

[*4 markah*]

(ii) Based on the information at (i), draw both functions on the same graph paper.

Berdasarkan maklumat dalam (i), lukiskan kedua-dua fungsi tersebut pada kertas graf yang sama.

[4 marks]

[4 *markah*]

(iii) Based on your graph, plot the point of intersection of the two functions.

Berdasarkan graf anda, tentukan titik persilangan bagi kedua-dua fungsi tersebut.

[2 marks]

[2 *markah*]

SOALAN TAMAT

FORMULAE TABLE
DBM 10213 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

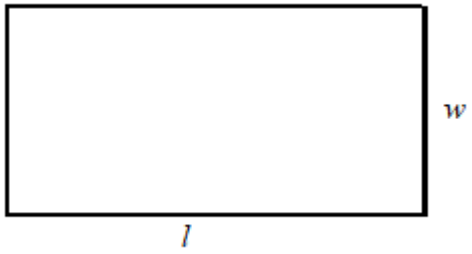
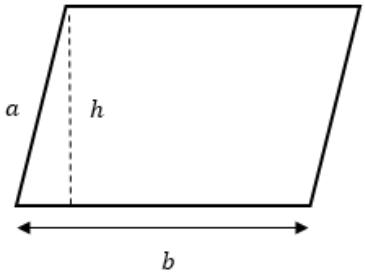
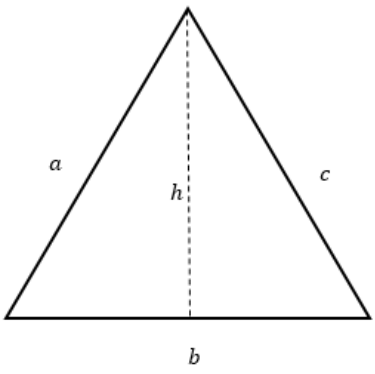
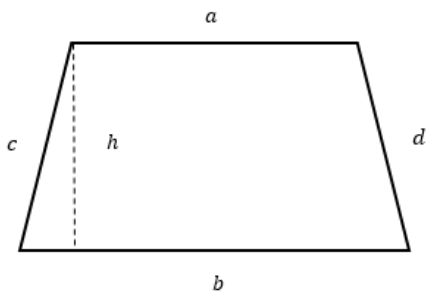
$$Area\ of\ segment = \frac{1}{2}r^2(\theta_1 - \sin\theta_2)$$

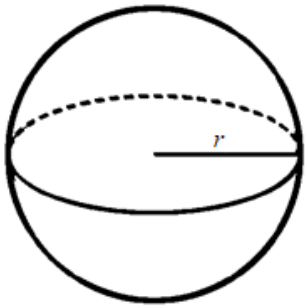
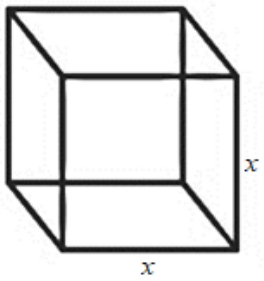
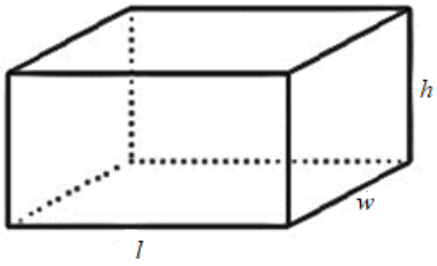
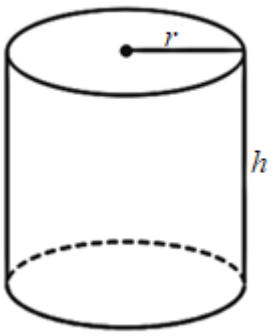
θ_1 must be in radian
θ_2 must be in degree

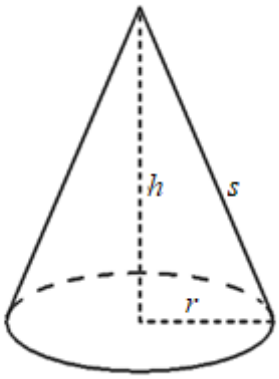
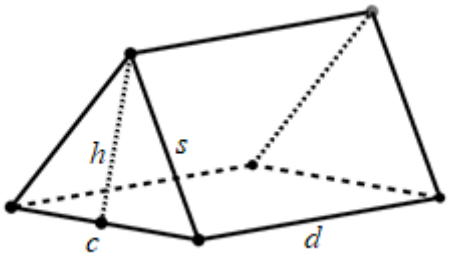
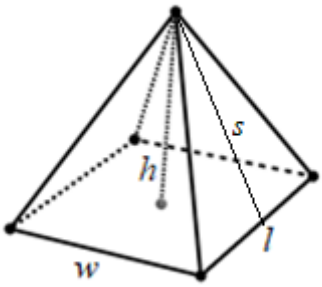
$$Area\ of\ segment = \frac{1}{2}r^2\left[\left(\theta \times \frac{\pi}{180^\circ}\right) - \sin\theta\right]$$

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	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 	$SA = 4\pi r^2$	$V = \frac{4}{3}\pi r^3$
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 	$SA = wl + 2ls$	$V = \frac{1}{3}wl \times h$