

TRIGONOMETRI / TRIGONOMETRY

1. KELANTAN

Diberi fungsi trigonometri $y = 3 \cos 2x - 1$

Given a trigonometric function $y = 3 \cos 2x - 1$

(a) (i) Tentukan amplitud, dan tempoh bagi fungsi tersebut.

Determine the amplitude, and period of the function.

[2 markah/ marks]

(ii) Lukiskan graf fungsi $y = 3 \cos 2x - 1$ bagi satu kitaran lengkap dari

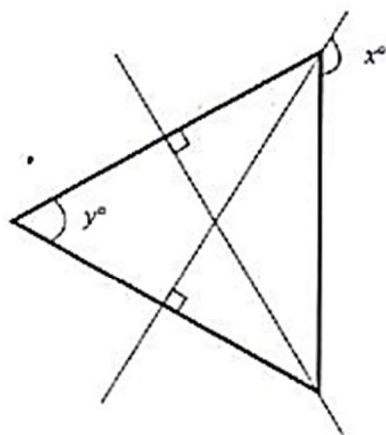
$$0^\circ \leq x \leq 360^\circ.$$

Draw the graph of the function $y = 3 \cos 2x - 1$ for one complete cycle from

$$0^\circ \leq x \leq 360^\circ.$$

[2 markah/ marks]

(b) Rajah 9 menunjukkan sebuah segitiga sama sisi dengan panjang setiap sisi adalah 7cm dan beberapa garis lurus yang merentasinya.



Rajah 9/ Diagram 9

(i) Cari nilai bagi $\cos x^\circ$.

Find the value of $\cos x^\circ$.

(ii) Tanpa menggunakan kalkulator, cari hasil tambah bagi $\cos x^\circ$ dan $\sin y^\circ$.

Without using a calculator, find the sum of $\cos x^\circ$ and $\sin y^\circ$.

Jawapan/ Answer :

(a) (i)

Amplitud : _____

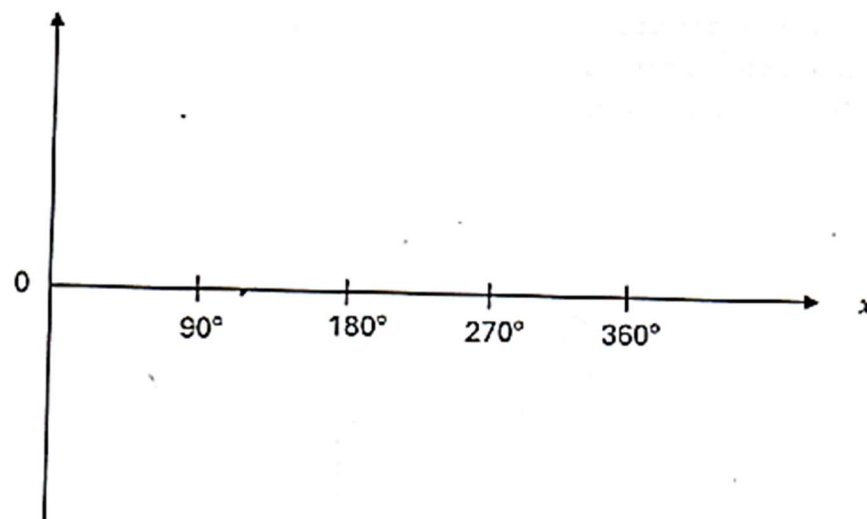
Amplitude

Tempoh : _____

Period

(ii) Graf fungsi $y = 3 \cos 2x - 1$

Graph the function $y = 3 \cos 2x - 1$



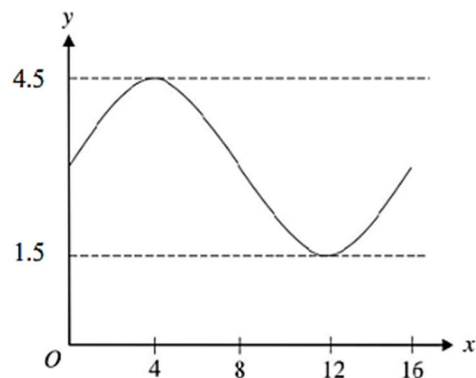
(b) (i)

(ii)

2. YIK

Rajah 7 menunjukkan aras air yang direkodkan di sebuah limbungan kapal. Diberi y mewakili aras air, dalam meter dan x mewakili masa, dalam jam.

Diagram 7 shows the water level recorded in a dockyard. Given y represents the water level, in meters and x represents time, in hours.



Rajah 7
Diagram 7

Nyatakan

State

- amplitud aras air
the amplitude of the water level
- tempoh aras air
the period of the water level
- fungsi trigonometri bagi graf tersebut dalam bentuk $y = a \sin bx + c$.
the trigonometric function of the graph is in the form $y = a \sin bx + c$.

[4 markah]

[4 marks]

Jawapan/Answer :

(a)

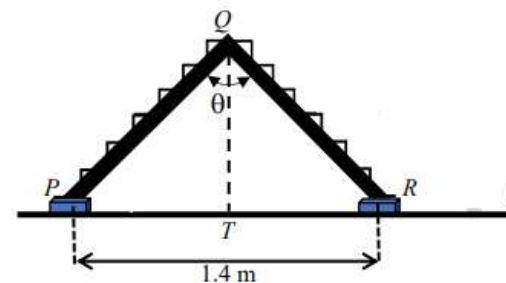
(b)

(c)

3. PAHANG SET

Rajah 5 menunjukkan sebuah tangga lipat yang diletakkan di atas lantai membentuk segi tiga sama kaki PQR . Diberi bahawa T ialah titik tengah PR dan $\sin \theta = 0.6157$ dan panjang $PR = 1.4$ m.

Diagram 5 shows a folding ladder placed on the floor forms an isosceles triangle PQR . Given that T is the midpoint of PR and $\sin \theta = 0.6157$ and the length of $PR = 1.4$ m.



Rajah 5 / Diagram 5

Hitungkan

Calculate

- panjang PQ , dalam cm, tangga itu,
the length of PQ , in cm, of the stair,
- nilai $\tan \angle QRS$.
the value of $\tan \angle QRS$.

[3 markah / marks]

[2 markah / marks]

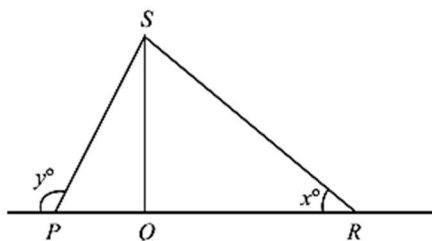
Jawapan / Answer

(a)

(b)

4. PERAK

Rajah 3 menunjukkan sebuah segitiga PRS . Panjang garis lurus PQR ialah 18 cm dan nisbah $PQ : QR = 1 : 2$.
Diagram 3 shows a PRS triangle. The length of the straight line PQR is 18 cm and the ratio $PQ : QR = 1 : 2$.



Rajah 3 / Diagram 3

Diberi $\tan y^\circ = -2.4751$, hitung

Given that $\tan y^\circ = -2.4751$, calculate

- panjang QS
the length of QS ,
- nilai x° .
the value of x° .

Jawapan / Answer :

(a)

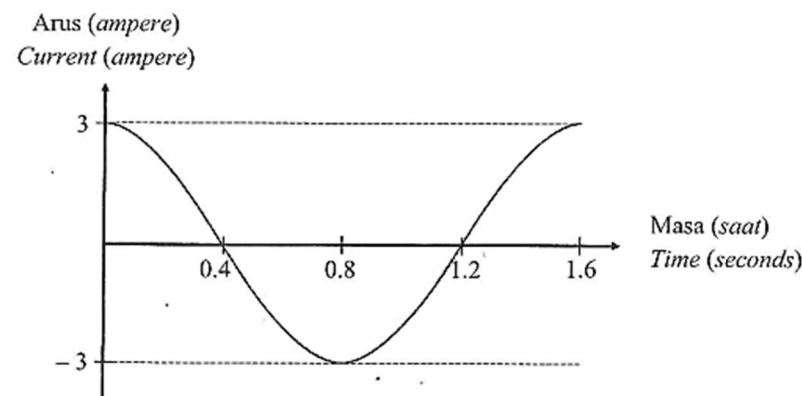
(b)

[4 markah / 4 marks]

5. SABK

Rajah 5 menunjukkan sebuah graf yang diperoleh pada skrin sebuah osiloskop apabila suatu bekalan arus ulang alik disambungkan kepadanya.

Diagram 5 shows a graph obtained on the screen of an oscilloscope when an alternating current supply is connected to it.



Rajah 5
Diagram 5

- Apakah jenis fungsi trigonometri yang diwakili oleh graf itu?
What type of trigonometric function does the graph represent?
- Nyatakan amplitud arus itu.
State the amplitude of the current.
- Nyatakan tempoh arus itu.
State the duration of the current.

[3 markah]

[3 marks]

Jawapan / Answer:

(a)

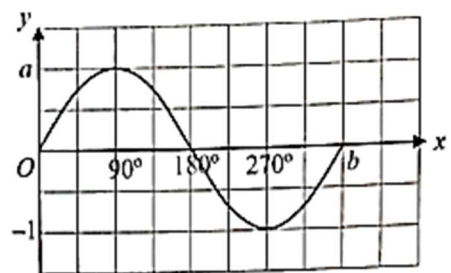
(b)

(c)

6. N9

Rajah 8 ialah graf yang menunjukkan bentuk gelombang bunyi yang dihasilkan dari bunyi radio bagi tahap 1 menggunakan Osiloskop Sinar Katod (OSK).

Diagram 8 is a graph showing the shape of the sound wave produced from radio sound for level 1 using a Cathode Ray Oscilloscope (OSK).



Rajah 8
Diagram 8

- (a) Nyatakan nilai a dan nilai b .
Seterusnya, tentukan fungsi trigonometri bagi graf yang ditunjukkan oleh OSK itu.

State the value of a and b .

Hence, determine the trigonometric function of the graph shown by the OSK.

- (b) Apabila bunyi ditetapkan pada tahap 3, amplitud dan frekuensi gelombang bertambah. Graf gelombang itu diwakili oleh fungsi $y = 2 \sin 2x$.

When the sound is set to level 3, the amplitude and frequency of the wave increases.

The graph of the wave is represented by the function $y = 2 \sin 2x$.

- (i) Pada ruang jawapan lakarkan graf bagi $y = 2 \sin 2x$ bagi $0^\circ \leq x \leq 270^\circ$.
At the answer space, sketch the graph for $y = 2 \sin 2x$ bagi $0^\circ \leq x \leq 270^\circ$.
- (ii) Seterusnya cari nilai x apabila $y = 2$.
Hence, find the value of x when $y = 2$.

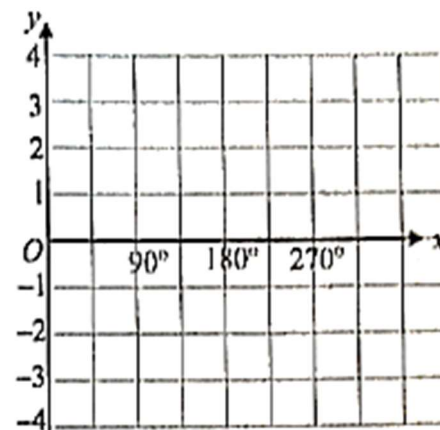
[8 markah]

[8 marks]

Jawapan / Answer :

(a)

(b) (i)



(ii)

7. SELANGOR SET 1

- (a) Diberi $\cos \theta^\circ = -0.6947$ dan $90^\circ \leq \theta \leq 270^\circ$, hitung nilai-nilai θ . [2 markah]
 Given the $\cos \theta^\circ = -0.6947$ and $90^\circ \leq \theta \leq 270^\circ$, calculate the values of θ . [2 marks]

- (b) (i) Pada Rajah 5 di ruang jawapan, lakarkan graf $y = 2 \cos 2x + 2$ untuk $0^\circ \leq \theta \leq 360^\circ$. [2 markah]

On Diagram 5 in the answer space, sketch the graph of $y = 2 \cos 2x + 2$ for $0^\circ \leq \theta \leq 360^\circ$. [2 marks]

- (ii) Berdasarkan graf yang telah dilukis, nyatakan kesan perubahan graf apabila diberi nilai tempoh adalah 90° . [1 markah]

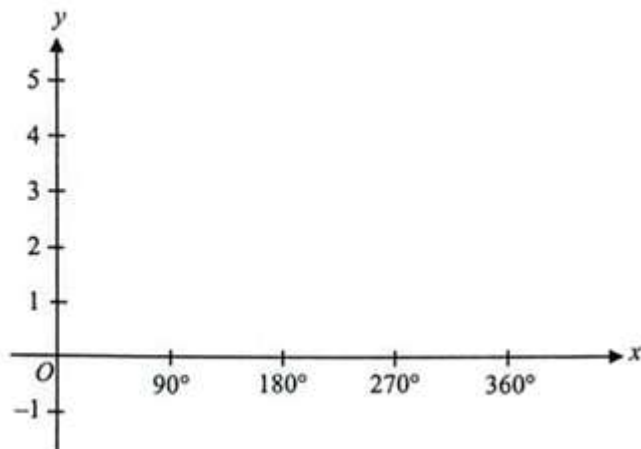
Based on the graph that has been drawn, state the effect of changing the graph when given a period value of 90° . [1 mark]

Jawapan / Answer :

(a)

(b) (i)

Rajah 5
Diagram 5



(ii)

8. SELANGOR SET 2

- (a) Diberi $\cos \theta^\circ = -0.5150$ dan $90^\circ \leq \theta \leq 270^\circ$, hitung nilai θ . [2 markah]
 Given the $\cos \theta^\circ = -0.5150$ and $90^\circ \leq \theta \leq 270^\circ$, calculate the value of θ . [2 marks]

- (b) (i) Pada Rajah 2 di ruang jawapan, lakarkan graf $y = 1.5 \cos 2x - 1$ dengan keadaan $0^\circ \leq \theta \leq 360^\circ$. [2 markah]

On Diagram 2 in the answer space, sketch the graph of $y = 1.5 \cos 2x - 1$ with the condition $0^\circ \leq \theta \leq 360^\circ$. [2 marks]

- (ii) Berdasarkan graf yang telah dilukis, nyatakan kesan perubahan graf apabila diberi nilai amplitud adalah 3. [1 markah]

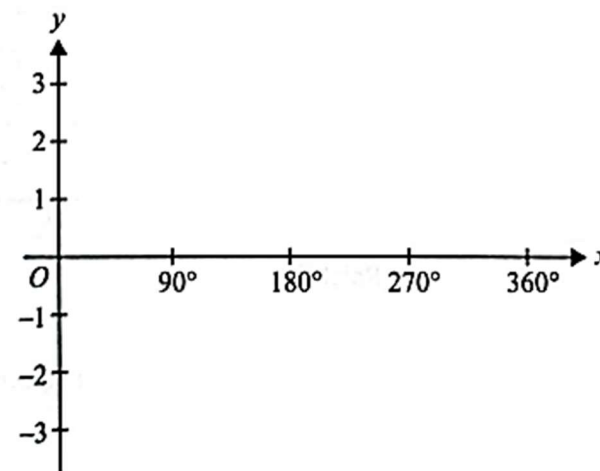
Based on the graph that has been drawn, state the effect of changing the graph when given an amplitude value of 3. [1 mark]

Jawapan / Answer :

(a)

(b) (i)

Rajah 2
Diagram 2

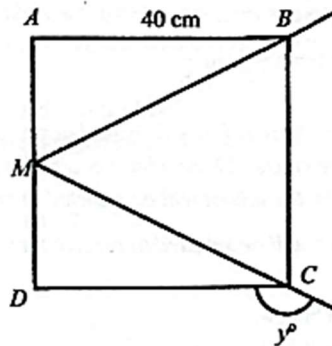


(ii)

9. MUAR JOHOR

Rajah 9 menunjukkan sebuah bingkai gambar berbentuk segi empat sama yang digantung pada dinding. Dua urat benang, AM dan MB diikat pada bingkai itu.

Diagram 9 shows a square picture frame which is hung on the wall. Two threads, AM and MB are tied to the frame.



Rajah 9
Diagram 9

Jika M ialah titik tengah AD ,
If M is the midpoint of AD ,

- (a) hitung panjang BM .
calculate the length of BM .
- (b) Seterusnya, cari nilai $\cos y^\circ$.
Hence, find the value of $\cos y^\circ$.

[2 markah / marks]

[2 markah / marks]

Jawapan / Answer:

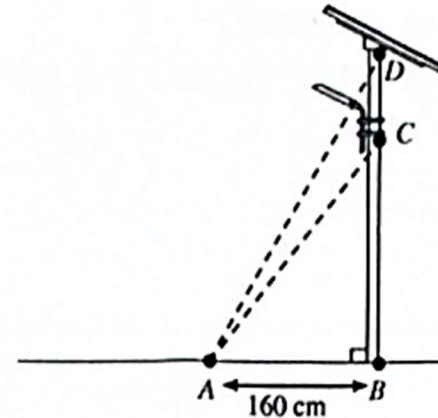
(a)

(b)

10. SPMU

Rajah 3 menunjukkan sebatang lampu solar tegak, BCD di atas satah mengufuk. Titik A dan B terletak di atas satah itu. Diberi $AB : BC = 2 : 3$.

Diagram 3 shows a vertical solar light pole, BCD on a horizontal plane. Point A and point B lie on the plane. It is given that $AB : BC = 2 : 3$.



Rajah 3
Diagram 3

Jika $\angle BAD = 60^\circ$, hitung jarak DC , dalam cm.

[3 markah]

If $\angle BAD = 60^\circ$, calculate the distance of DC , in cm.

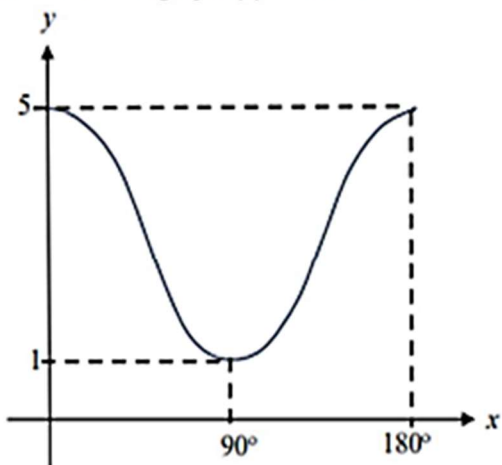
[3 marks]

Jawapan / Answer:

11. TERENGGANU MPP3

- (a) Nyatakan amplitud dan tempoh untuk fungsi trigonometri $y = 3 \cos 3x + 2$.
 State the amplitude and the period for trigonometric function $y = 3 \cos 3x + 2$.
 [2 markah]
 [2 marks]

- (b) Rajah 7 menunjukkan graf $y = a \cos bx + 3$.
 Diagram 7 shows a graph of $y = a \cos bx + 3$.



Rajah 7
 Diagram 7

Tentukan nilai a , b dan nilai maksimum daripada graf itu.

Determine the values of a , b and the maximum value from the graph.

[3 markah]
 [3 marks]

- (c) Lengkapkan jadual di ruang jawapan dan lakar graf $y = 3 \sin 2x + 2$ untuk $0^\circ \leq x \leq 180^\circ$.
 Complete the table in answer space and sketch a graph $y = 3 \sin 2x + 2$ for $0^\circ \leq x \leq 180^\circ$.

[4 markah]
 [4 marks]

Jawapan / Answer :

- (a) Amplitud / amplitude :

Tempoh / period :

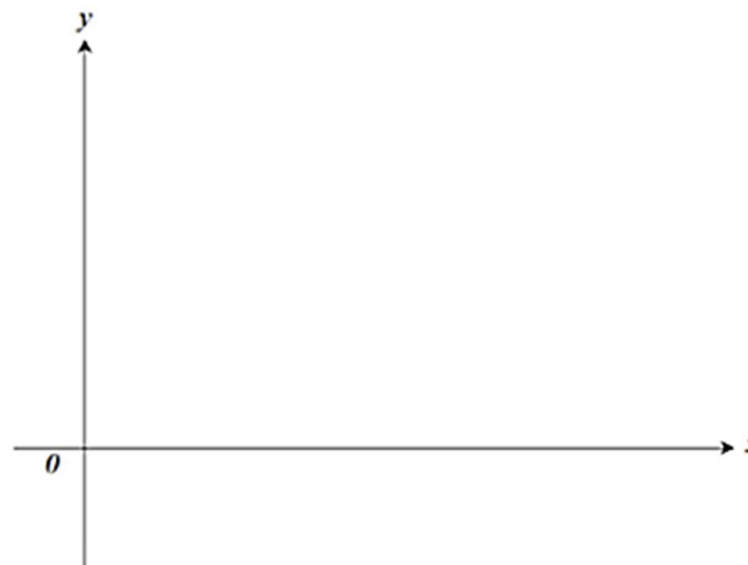
- (b) a :

b :

nilai maksimum / maximum value :

- (c)

x	0°	45°	90°	135°	180°
y					



SKEMA JAWAPAN :

1. KELANTAN

(a) (i)	amplitude = 3 dan tempoh = 180°	2	8
(ii)		2	
(b)(i)	$\cos 150^\circ$ atau $-\cos 30^\circ$ -0.8657 @ $-6.06 / 7$	1	
(ii)	$-\frac{\sqrt{3}}{2}$ atau -0.8660	1	
	$-\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2}$	1	
	0	1	

2. YIK

(a)	1.5	P1	4
(b)	1.6 jam	P1	
(c)	$y = 1.5 \sin 22.5x + 3$	K2	
	Nota: Betul mana-mana 2 nilai, beri K1 $a = 1.5, b = 22.5, c = 3$		

3. PAHANG SET 1

(a)	$\sin^{-1} 0.6157$ atau 38 atau 19	1	3
	$\sin \sin 19^\circ = \frac{0.7}{PQ}$	1	
	215	1	
(b)	2.033	1	
	$-\frac{2.033}{0.7}$ atau -2.90	1	

4. PERAK

(a)	$\tan 68^\circ = \frac{QS}{6}$ atau setara	1	4
	$QS = 14.85$	1	
(b)	$\tan x = \frac{14.85}{12}$	1	
	51.06	1	

5. SABK

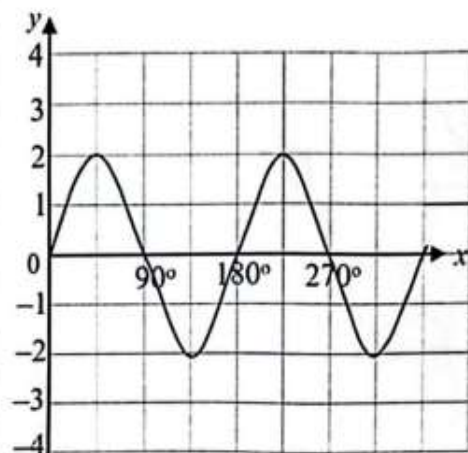
Kosinus	1
3	1
1.6	1

6. N9

(a)	$a = 1$ $b = 360^\circ$ $y = \sin x$	P1 P1 P1
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(b)

(i)



Bentuk graf sin, 2 kitaran lengkap dan amplitud 2

Nota :

1. Bentuk graf sin dan 2 kitaran lengkap atau bentuk graf sin dan amplitud 2 beri P2
2. Bentuk graf sin dilihat beri P1

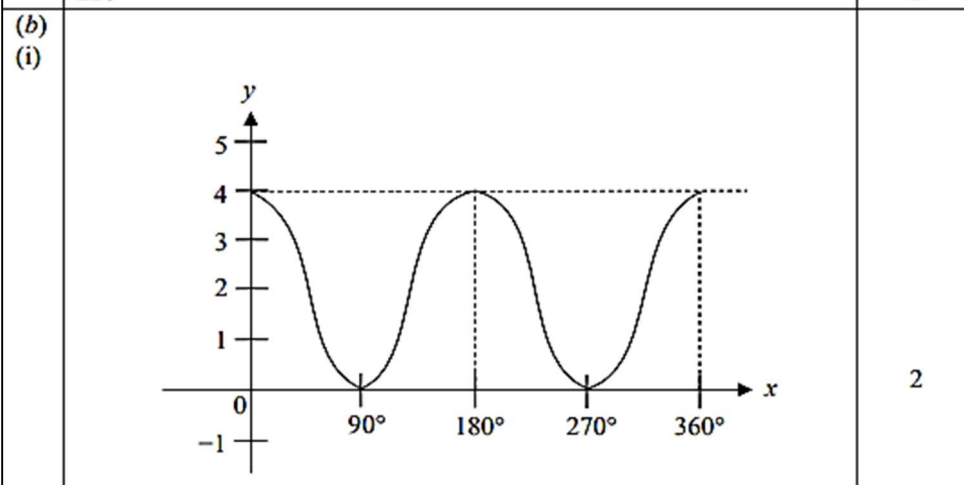
(ii) $45^\circ, 225^\circ$

P3

N1,N1

7. SELANGOR SET 1

(a)	134	1
	226	1



2

(b)	Kitaran lengkap graf kos akan menjadi 4 atau setara	1
(ii)	A complete cycle of the cos graph will be 4 or equivalent	

8. SELANGOR SET 2

(a)	121	1
	239	1
(b)		2
(c)	Titik maksimum akan berada pada $y = 2$ dan titik minimum akan berada pada $y = -4$ <i>The maximum point will be at $y = 2$ and the minimum point will be at $y = -4$</i>	1

9. MUAR JOHOR

(a)	$\sqrt{40^2 + 20^2}$ 44.72	K1 N1
(b)	Kos $y = -\frac{40}{44.72}$ $= -0.8944$ atau $-\frac{500}{559}$	K1 N1

10. SPMU

$$\begin{aligned}
 AB &= BC & \tan 60^\circ &= \frac{BD}{160} \\
 2 &: 3 & & \\
 160 &: x & BD &= 277.13 \\
 x &= \frac{160 \times 3}{2} & CD &= 277.13 - 240 \\
 BC &= 240 & &= 37.13
 \end{aligned}$$

11. TERENGGANU MPP3

(a) Amplitude : 3
Amplitude: 3
 Tempoh : 120°
Duration : 120°

U1

U1

(b) a : 2
 b : 2
 nilai maksimum : 5
maximum value : 5

U1

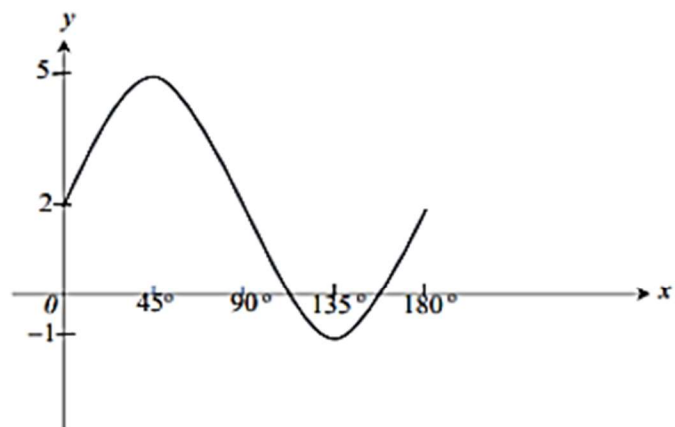
U1

U1

(c)

<i>x</i>	0°	45°	90°	135°	180°
<i>y</i>	2	5	2	-1	2

U1



-1, 2 dan 5 dilabel pada paksi y
 Sudut 45° , 90° , 135° dan 180° dilabel pada paksi x
 Bentuk graf betul

W1

W1

W1

-1, 2 and 5 are labelled on the y axis
 Angles 45° , 90° , 135° and 180° are labelled on the x-axis
 The shape of the graph is correct