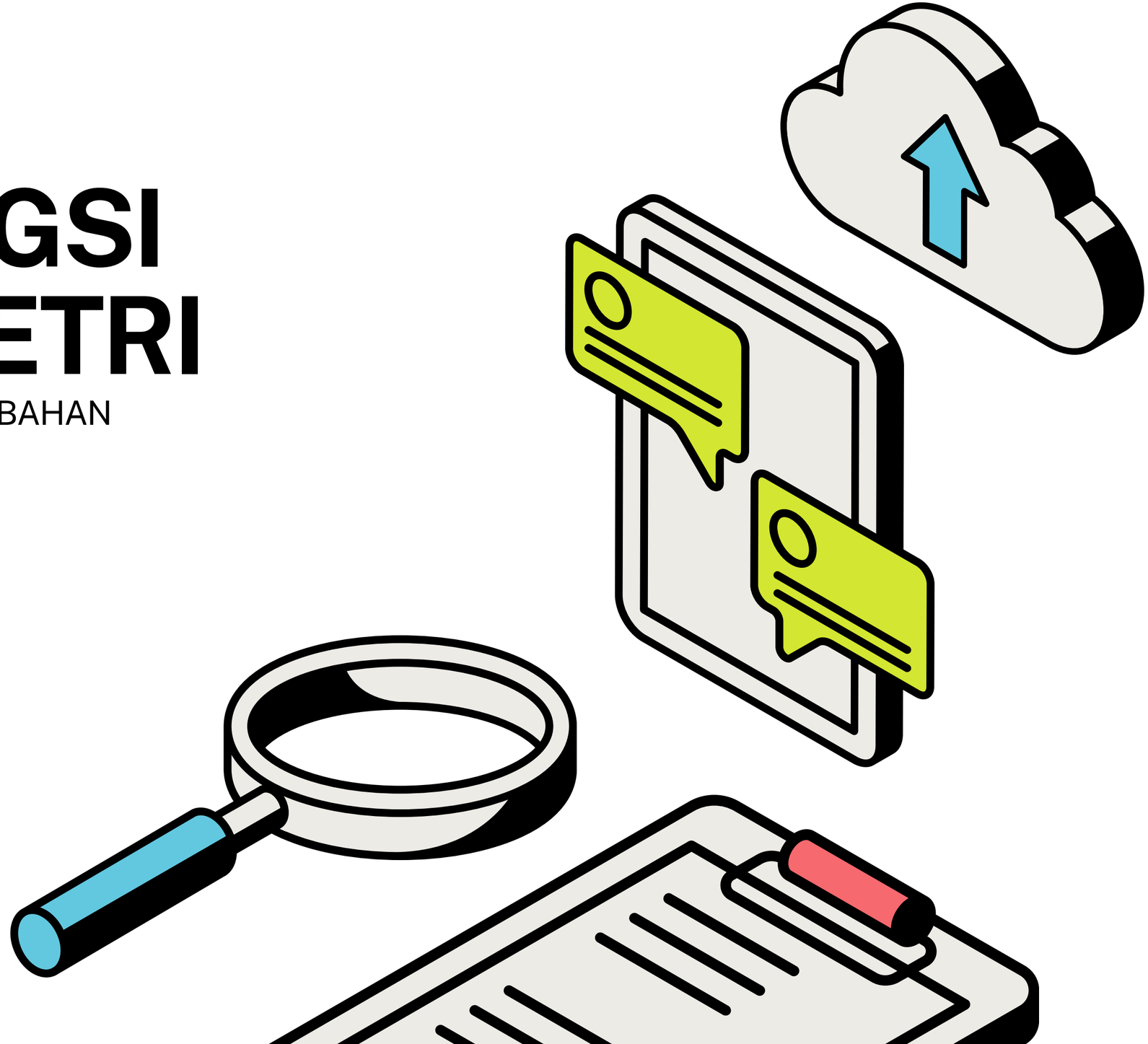
TINGKATAN 5

BAB 6 : FUNGSI TRIGONOMETRI

KOMPILASI SOALAN MATEMATIK TAMBAHAN
PERCUBAAN SPM 2023

SKEMA PEMARKAHAN



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KLIK SINI https://t.me/cikgufarhanmath

KELANTAN (K1)

FUNGSI TRIGONOMETRI

3. (a) Diberi bahawa $sek\ \theta = \frac{1}{h}$ dengan keadaan θ ialah sudut tirus. Cari $\sin^2 \frac{\theta}{2}$.

[3 *markah*]

Given $sek\ \theta = \frac{1}{h}$ *where* θ *is an acute angle. Find* $\sin^2 \frac{\theta}{2}$. [3 *marks*]

(b) Selesaikan persamaan $3 + 4kos2x = -\sin x$ untuk $0^0 \le x \le 360^0$. [3 *markah*]

Solve the equation $3 + 4kos2x = -\sin x$ *for* $0^0 \le x \le 360^0$. [3 *marks*]

3 (a)	$kos\ \theta = h$	P1
	$h = 1 - 2\sin^2 \frac{\theta}{2}$	K1
	$\frac{1-h}{2}$	N1
3 (b)	$8\sin^2 x - \sin x - 7 = 0$	K1
	$\sin x = -\frac{7}{8}$ dan $\sin x = 1$	K1
	$x = 90^0, 241.04^0, 298.96^0$	N1

MELAKA (K1)

FUNGSI TRIGONOMETRI

13. (a) Lakar graf $y = -3kos\ 2x$ untuk $0 \le x \le \frac{3}{2}\pi$. [3 markah]

Sketch the graph of graf $y = -3\cos 2x$ *for* $0 \le x \le \frac{3}{2}\pi$. [*3 marks*]

(b) Seterusnya, dengan menggunakan paksi yang sama, lakar satu graf yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $\frac{\pi}{x} + 6\cos 2x = 0$ untuk $0 \le x \le \frac{3}{2}\pi$. Nyatakan bilangan penyelesaiannya.

[3 markah]

Hence, using the same axes, sketch a suitable graph to find the number of solutions for the equation $\frac{\pi}{x} + 6\cos 2x = 0$ *for* $0 \le x \le \frac{3}{2}\pi$. *State the number of solutions.*

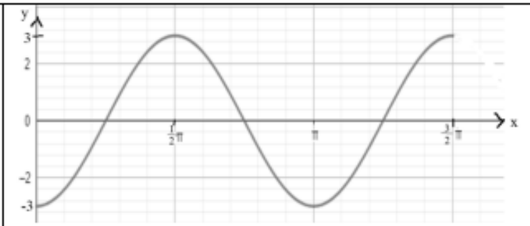
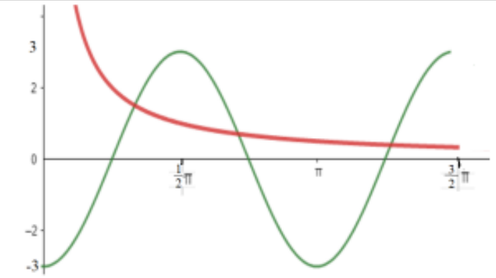
[3 *marks*]

(c) Dua penyelesaian diperoleh jika $y = \frac{3p}{2}$ dilakarkan pada paksi-paksi yang sama di 13(b), dengan keadaan p ialah pemalar. Cari nilai-nilai p.

[2 markah]

There are two solutions obtained if $y = \frac{3p}{2}$ *is sketched at the same axes in* 13(*b*), *such that p is a constant. Find the values of p.*

[2 *marks*]

13. (a)	 *Bentuk kos at least 1 cycle*	1
	Amplitude *Min = -3* *Max = 3*	1
	Cycles $1\frac{1}{2}$ *cycles & -ve cos graph*	1
(b)	 $y = \frac{\pi}{2x}$	1
	Reciprocal graph	1
	No of solutions = 3	1
(c)	$\frac{3p}{2} = 3$ or $\frac{3p}{2} = -3$	1
	$p = 2$ and $p = -2$	1

N9 (K1)

FUNGSI TRIGONOMETRI

15 (*a*) Jika $\tan(A+B)=-3$ dan $\tan A=2$. Cari nilai $\tan B$. [2 *markah*]

If $\tan(A+B)=-3$ *and* $\tan A=2$, *find the value of* $\tan B$. [2 *marks*]

(*b*) Selesaikan persamaan $\sin^2 x=1-\kos x+4\kos\left(\frac{3\pi}{2}\right)$ bagi $0\le x\le 2\pi$. [3 *markah*]

Solve the equation $\sin^2 x=1-\cos x+4\cos\left(\frac{3\pi}{2}\right)$ *for* $0\le x\le 2\pi$. [3 *marks*]

(*c*) Diberi $\sin\theta=4k$, dengan keadaan k ialah pemalar dan $90°\le\theta\le 180°$.

Cari $\kos^2\frac{1}{2}\theta$ dalam sebutan k. [3 *markah*]

Given that $\sin\theta=4k$, *such that* k *is a constant and* $90°\le\theta\le 180°$.

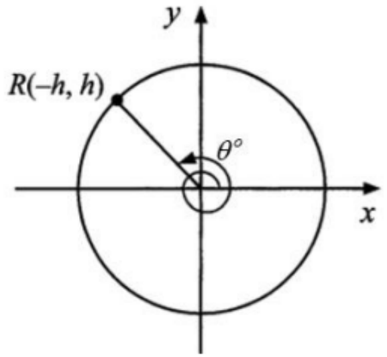
Find $\cos^2\frac{1}{2}\theta$ *in terms of* k. [3 *marks*]

15	(a)	$\frac{2+\tan B}{1-2\tan B}=-3$	K1
		$\tan B=1$	N1
	(b)	$1-\kos^2 x=1-\kos x$	K1
		$\kos x(\kos x-1)=0$	K1
		$0^0,90^0,270^0,360^0$	N1
	(c)	$\kos\theta=-\sqrt{1-16k^2}$	K1
		$2\kos^2\frac{\theta}{2}-1=-\sqrt{1-16k^2}$	K1
		$\frac{1-\sqrt{1-16k^2}}{2}$	N1

PAHANG (K1)

FUNGSI TRIGONOMETRI

15 (*a*) Rajah 8 menunjukkan titik R terletak pada lilitan sebuah bulatan unit.
Diagram 8 shows a point R lies on the circumference of a unit circle.



Rajah 8
Diagram 8

(i) Nyatakan nilai θ.
State the value of θ.

(ii) Ungkapkan $2\,\text{kosek}\,(-\theta)$ dalam sebutan h.
Express $2\,\text{cosec}\,(-\theta)$ in terms of h.

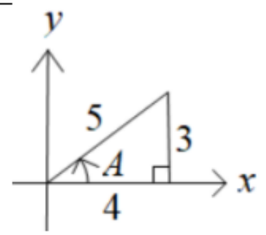
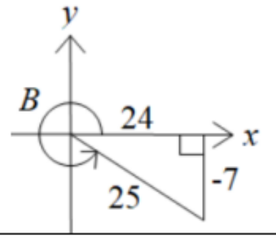
[3 *markah*]
[3 *marks*]

(*b*) Diberi bahawa $\tan A = \frac{3}{4}$ dan $\tan B = -\frac{7}{24}$, dengan keadaan A ialah sudut tirus dan B ialah sudut refleks. Cari
It is given that $\tan A = \frac{3}{4}$ and $\tan B = -\frac{7}{24}$, such that A is an acute angle and B is a reflex angle. Find

(i) $\sin(A+B)$,

(ii) $\tan(A-B)$.

[5 *markah*]
[5 *marks*]

15	(*a*)	(i)	495^o	1
		(ii)	$\frac{2}{-\sin\theta}$	1
			$-\frac{2}{h}$	1
	(*b*)	(i)	$\sin A = \frac{3}{5}$ @ $\text{kos}\, A = \frac{4}{5}$ @  ATAU $\sin B = -\frac{7}{25}$ @ $\text{kos}\, B = \frac{24}{25}$ @  	1
			$\left(\frac{3}{5}\right)\left(\frac{24}{25}\right)+\left(\frac{4}{5}\right)\left(-\frac{7}{25}\right)$	1
			$\frac{44}{125}$	1
		(ii)	$\frac{\frac{3}{4}-\left(-\frac{7}{24}\right)}{1+\left(\frac{3}{4}\right)\left(-\frac{7}{24}\right)}$	1
			$\frac{4}{3}$	1

PERLIS (K1)

FUNGSI TRIGONOMETRI

10 Diberi bahawa kos x kos $y = \frac{1}{4}$ dan sin x sin $y = \frac{3}{8}$. Cari nilai bagi,

Given that $\cos x \cos y = \frac{1}{4}$ *and* $\sin x \sin y = \frac{3}{8}$. *Find the value of,*

(a) (i) kos $(x - y)$

cos $(x - y)$

(ii) kos $(x + y)$

cos $(x + y)$

[3 markah / *marks*]

(b) Seterusnya, cari nilai-nilai yang mungkin bagi x dan y di antara 0° dan 90°.

Hence, find the possible values of x and y between 0° *and* 90°.

[3 markah / *marks*]

10

Guna

(a) $\cos x \cos y + \sin x \sin y$ atau $\cos x \cos y - \sin x \sin y$ (K1)

(i) $\frac{5}{8}$ [N1] **(ii)** $-\frac{1}{8}$ [N1] **3**

(b) $x - y = 51.32^\circ$ atau $x + y = 97.18^\circ$ [N1]

Selesaikan persamaan serentak (K1)

$2y = 45.86^\circ$ atau $2x = 148.50^\circ$

$x = 74.25^\circ$ dan $y = 22.93^\circ$ [N1] **3**

SABAH (K1)

FUNGSI TRIGONOMETRI

13. a) Diberi bahawa kos $(\alpha + \beta) = \frac{1}{4}$ dan sin α sin $\beta = \frac{1}{2}$. Cari nilai setiap yang berikut:

Given that cos $(\alpha + \beta) = \frac{1}{4}$ *and* sin α sin $\beta = \frac{1}{2}$. *Find the value of each of the following:*

i) kos α kos β,

cos α cos β,

ii) kos $(\alpha - \beta)$.

cos $(\alpha - \beta)$.

[4 markah/*marks*]

b) Selesaikan persamaan $4 \sin\theta = \sqrt{2}$ sek θ bagi semua sudut antara 0°dengan 360°.

Solve the equation $4 \sin\theta = \sqrt{2} \sec\theta$ *for all the angles between* 0°*and* 360°.

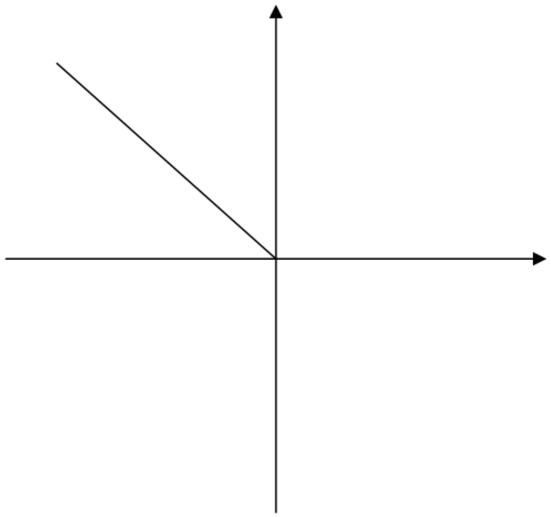
[3 markah/*marks*]

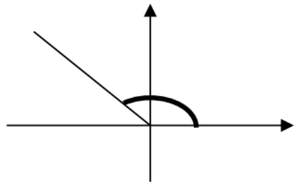
c) Pada ruang jawapan di bawah, labelkan sudut $(180° - p)$, jika sudut rujukan ialah p.

In the answer space below, label the angle $(180° - p)$, *if the reference angle is* p.

[1 markah/*mark*]

c)



13	a) i) $\cos\alpha\cos\beta - \sin\alpha\sin\beta = \frac{1}{4}$ $\frac{3}{4}$ ii) $\cos\alpha\cos\beta + \sin\alpha\sin\beta$ $\frac{5}{4}$	 K1 N1 K1 N1
	b) $4\sin\theta\cos\theta = \sqrt{2}$ $\sin 2\theta = \frac{\sqrt{2}}{2}$ $2\theta = \sin^{-1}(\frac{\sqrt{2}}{2})$ $2\theta = 45°, 135°, 405°, 495°$ $\theta = 22.5°, 67.5°, 202.5°, 247.5°$	K1 K1 N1
	c) 	P1

SELANGOR SET 1 (K1)

FUNGSI TRIGONOMETRI

14 (*a*) Buktikan identiti trigonometri $\tan y = \dfrac{\kos (x-y) - \kos (x+y)}{\sin (x-y) + \sin (x+y)}$

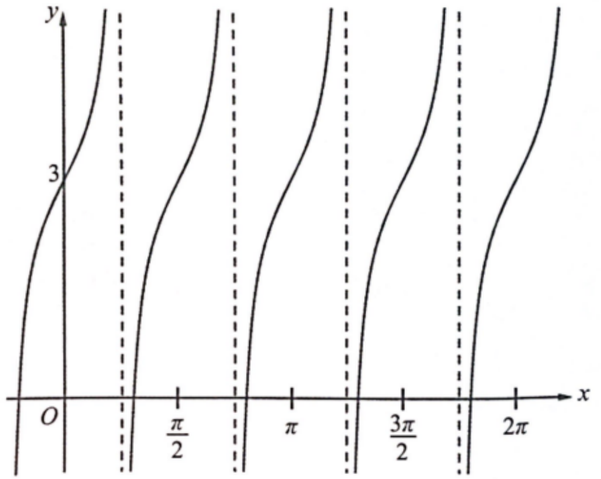
Prove the trigonometric identity $\tan y = \dfrac{\cos (x-y) - \cos (x+y)}{\sin (x-y) + \sin (x+y)}$

[4 markah]
[4 *marks*]

14	(*a*)		Guna rumus sudut majmuk $\dfrac{kos\ (x-y)\ -\ kos\ (x+y)}{\sin(x-y)\ +\sin(x+y)}$ $\dfrac{kos\ x\ kos\ y + \sin x \sin y - [kos\ x\ kos\ y\ - \sin x \sin y]}{\sin x\ kos\ y - kos\ x \sin y + \sin x\ kos\ y + kos\ x \sin y}$	P1
			Guna rumus $kos\ (x-y)$ @ $kos\ (x+y)$ @ $\sin(x-y)$ @ $sin\ (x+y)$ dengan betul	P1
			$\dfrac{2 \sin x \sin y}{2 \sin x\ kos\ y}$	K1
			$\tan y$	N1
	(*b*)	(i)	$b = 2$	P1
			$c = 3$	P1
		(ii)	Menggantikan nilai x dan y dari koordinat $\left(\frac{\pi}{8}, 7\right)$ ke dalam persamaan $y = a \tan bx + c$.	K1
			$a = 4$	N1

(*b*) Rajah 14 menunjukkan sebahagian daripada graf $y = a \tan bx + c$ yang melalui titik (0, 3) dan $\left(\frac{\pi}{2}, 3\right)$.

Diagram 14 *shows part of the graph of* $y = a \tan bx + c$ *passing through points* (0, 3) *and* $\left(\frac{\pi}{2}, 3\right)$.



Rajah 14
Diagram 14

Cari
Find

(i) nilai-nilai bagi b dan c,
the values of b *and of* c,

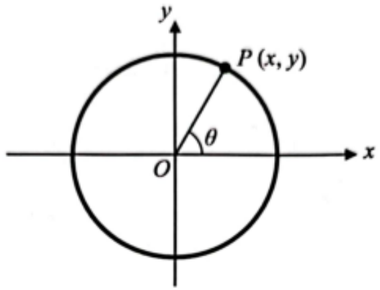
(ii) nilai a, diberi bahawa titik $(\frac{\pi}{8}, 7)$ juga terletak pada graf itu.
the value of a, *given that the point* $(\frac{\pi}{8}, 7)$ *also lies on the graph.*

[4 markah]

SELANGOR SET 2 (K1)

FUNGSI TRIGONOMETRI

13 (*a*) Rajah 13 menunjukkan satu titik P yang terletak pada lilitan suatu bulatan unit.
Diagram 13 *shows a point P lies on the circumference of an unit circle.*



Rajah 13
Diagram 13

Berdasarkan rajah tersebut,
Based on the diagram,

(i) terbitkan identiti asas trigonometri $\sin^2\theta + \text{kos}^2\theta = 1$.
derive the basic trigonometric identity $\sin^2\theta + \cos^2\theta = 1$.

(ii) cari nilai kos 2θ jika $x = 0.1736$.
find the value of $\cos 2\theta$ *if* $x = 0.1736$.

[4 markah]
[4 *marks*]

(*b*) Diberi bahawa $\tan A = 3$ dan $\tan(A - B) = \frac{2}{3}$, dengan keadaan A ialah sudut refleks dan B ialah sudut tirus.
It is given that $\tan A = 3$ *and* $\tan(A - B) = \frac{2}{3}$, *where A is a reflex angle and B is an acute angle.*

Cari
Find

(i) kot A,
cot A,

(ii) nilai bagi tan B.
the value of tan B.

[4 markah]

13	(*a*)	(i)	$x = \text{kos}\,\theta, y = \sin\theta$ $y^2 + x^2 = 1$ (Dilihat) $\sin^2\theta + \text{kos}^2\theta = 1$	P1 N1
		(ii)	$\text{kos}\,\theta = 0.1736$ $2(0.1736)^2 - 1$ $= -0.9397$	 K1 N1
	(*b*)	(i)	$\text{kot}\,A = \frac{1}{3}$	P1
		(ii)	$\frac{\tan A - \tan B}{1 + \tan A \tan B} = \frac{2}{3}$ $\frac{3 - \tan B}{1 + 3\tan B} = \frac{2}{3}$ $\tan B = \frac{7}{9}$	P1 K1 N1

KELANTAN (K2)

FUNGSI TRIGONOMETRI

7 (a) Buktikan bahawa

Prove that

$$(\sin x - \cos x)^2 = 1 - \sin 2x$$

[2 *markah*]

[2 *marks*]

(b) Lakarkan graf fungsi trigonometri $y = 1 - \sin 2x$ bagi domain $0 \le x \le \frac{3}{2}\pi$. [3 *markah*]

Sketch the graph of the trigonometric function $y = 1 - \sin 2x$ *for the domain* $0 \le x \le \frac{3}{2}\pi$.

[3 *marks*]

(c) Seterusnya, cari

Hence, find

(i) nilai maksimum y dalam domain itu.

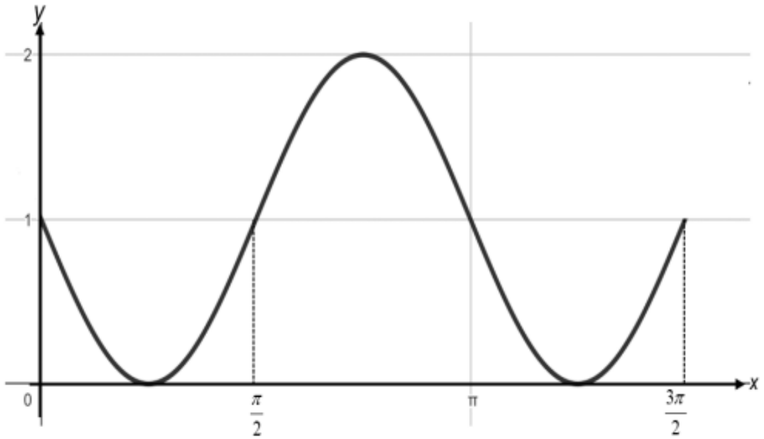
the maximum value of y *in that domain.*

(ii) bilangan penyelesaian bagi persamaan $1 - \sin 2x = k + 1$ untuk $-1 < k - 1 < 0$.

the number of solutions to the equation $1 - \sin 2x = k + 1$ *for* $-1 < k - 1 < 0$.

[3 *markah*]

[3 *marks*]

7 (a)	Use $\sin^2 x + \cos^2 x = 1$ atau $\sin 2x = 2\sin x kosx$ $1 - 2\sin x kosx$ atau $\cos^2 x + \sin^2 x - 2\sin x \cos x$	K1 N1
7 (b)	 Bentuk graf $-\sin x$ $1\frac{1}{2}$ pusingan bagi domain $0 \le x \le \frac{3}{2}\pi$ Min = 0, max=2, titik tengah = 1	P1 P1 P1
7 I(i)	2	N1
(ii)	Julat $0 < k < 1$ atau $y = k + 1,\ 1 < y < 2$ 2 penyelesaian	K1 N1

FUNGSI TRIGONOMETRI

MELAKA (K2)

6 (a) Buktikan bahawa $\frac{kos\,(A+B)}{Sin\,A\sin B} = kot\,A\,kot\,B - 1$.

Prove that $\frac{cos\,(A+B)}{Sin\,A\,Sin\,B} = cot\,A\,cot\,B - 1$.

[2 markah / *marks*]

(b) Selesaikan persamaan $\tan(45° + x) = 4\tan(45° - x)$ untuk $0° \le x \le 360°$.

Solve the equation $tan(45° + x) = 4\,tan(45° - x)$ *for* $0° \le x \le 360°$.

[5 markah/*marks*]

6(a)	$\frac{kos\,(A+B)}{Sin\,A\sin B} = \frac{kos\,A\,kos\,B - \sin A\sin B}{\sin A\sin B}$ $= \frac{kos\,A\,kos\,B}{\sin A\sin B} - \frac{\sin A\sin B}{\sin A\sin B}$ $= kot\,A\,kot\,B - 1$	1 1
(b)	$\tan(45° + x) = 4\tan(45° - x)$ $\frac{\tan 45° + \tan x}{1 - \tan 45°\tan x} = 4\left(\frac{\tan 45° - \tan x}{1 + tan45°\tan x}\right)$ $\frac{1+\tan x}{1-\tan x} = 4\left(\frac{1-\tan x}{1+\tan x}\right)$ $(3\tan x - 1)(\tan x - 3) = 0$ $\tan x = \frac{1}{3}$ atau $\tan x = 3$ $x = 18.43°, 71.57°, 198.43°, 251.57°$	1 1 1 1 1

N9 (K2)

6 (*a*) Buktikan $2\cot x\,(\sec x - \cos x) = 2\sin x$. [2 *markah*]

Prove $2\cot x\,(\sec x - \cos x) = 2\sin x$. [2 *marks*]

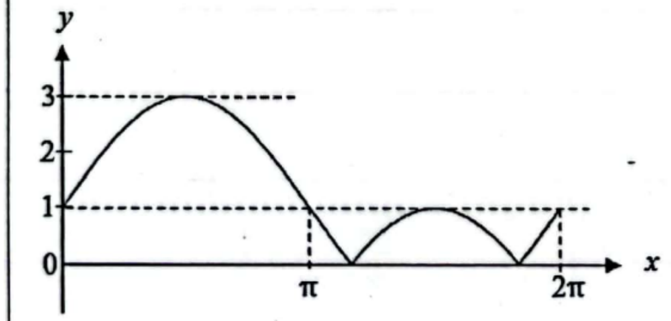
(*b*) (i) Seterusnya, lakar graf $y = |2\cot x\,(\sec x - \cos x) + 1|$ bagi $0 \le x \le 2\pi$.

Hence, sketch the graph of $y = |2\cot x\,(\sec x - \cos x) + 1|$ *for* $0 \le x \le 2\pi$.

[4 *markah*]
[4 *marks*]

(ii) 4 penyelesaian diperoleh jika $y = m$ dilakarkan pada paksi-paksi yang sama di 6(b)(i), dengan keadaan m ialah pemalar. Nyatakan julat nilai m. [1 *markah*]

4 number of solutions obtained if $y = m$ *is sketched at the same axes in* 6(b)(i), *such that m is a constant. State the range of values of m.* [1 *mark*]

6(a)	$2\left(\frac{\kos x}{\sin x}\right)\left(\frac{\sin^2 x}{\kos x}\right)$	K1
	$2\sin x$	N1
6(b) (i)	 • Untuk $0 \le x \le 2\pi$ • Label 0 dan 2π pada paksi x Lakaran graf sin Graf naik 1 unit ke atas 1 kitaran dan modulus Semua betul	P1 P1 P1 P1
(ii)	$0 < m \le 1$	N1

PAHANG (K2)

FUNGSI TRIGONOMETRI

5 (*a*) Buktikan $2\tan x \kos^2 x = \sin 2x$.

Prove that $2\tan x \cos^2 x = \sin 2x$.

[2 *markah*]
[2 *marks*]

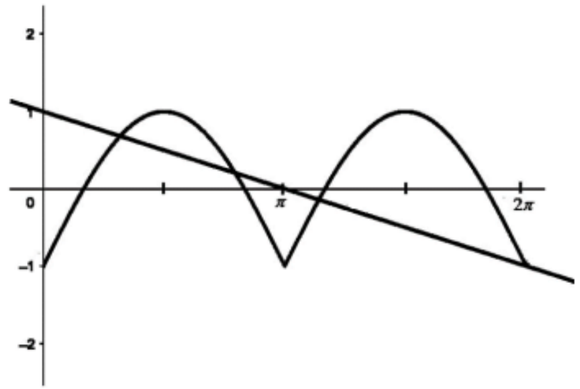
(*b*) (i) Lakarkan graf $y = 2|\sin x| - 1$ untuk $0 \le x \le 2\pi$.

Sketch the graph for $y = 2|\sin x| - 1$ *for* $0 \le x \le 2\pi$.

(ii) Seterusnya, dengan menggunakan paksi yang sama, lakar satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $2\pi|\sin x| + x = 2\pi$ untuk $0 \le x \le 2\pi$. Nyatakan bilangan penyelesaian itu.

Hence, by using the same axes, sketch a suitable straight line to find the number of solutions for the equation $2\pi|\sin x| + x = 2\pi$ *for* $0 \le x \le 2\pi$. *State the number of solutions.*

[6 *markah*]
[6 *marks*]

5	(*a*)		$2\frac{\sin x}{kosx} kos^2 x$	1
			$\sin 2x$ (terbukti)	1
	(*b*)	(i)		
			Bentuk graf sin	1
			Amplitud dan kitaran	1
			Modulus dan translasi	1
		(ii)	$y = 1 - \frac{x}{\pi}$	1
			Garis lurus dilukis dengan betul	1
			Bilangan penyelesaian = 4	1

PERLIS (K2)

FUNGSI TRIGONOMETRI

4 (a) Buktikan bahawa $2\ kot\ x\ sin^2\ x = \sin 2x$

Prove that $2\ cot\ x\ sin^2\ x = \sin 2x$.

[2 markah / *marks*]

(b) Seterusnya, selesaikan persamaan $kot\ x\ sin^2\ x = \frac{1}{4}$ untuk $0 \le x \le 2\pi$.

Hence, solve the equation $cot\ x\ sin^2\ x = \frac{1}{4}$ *for* $0 \le x \le 2\pi$.

[3 markah / *marks*]

(c) Lakar graf $y = kot\ x\ sin^2 x$ untuk $0 \le x \le 2\pi$.

Sketch the graph $y = cot\ x\ sin^2 x$ *for* $0 \le x \le 2\pi$.

[3 markah / *marks*]

4

(a) Guna $\frac{kos\ x}{sin\ x}$ K1

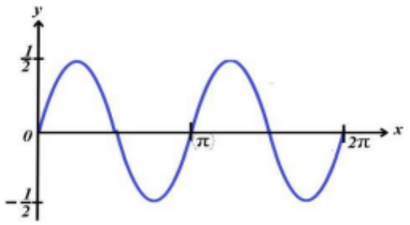
N1 $\sin 2x$

(b) $\sin 2x = \frac{1}{2}$ K1

Sudut rujukan $= \frac{\pi}{6}$ atau 30^o N1

$x = \frac{\pi}{12}, \frac{5}{12}\pi, \frac{13}{12}\pi, \frac{17}{16}\pi$ N1

(c) $y = \frac{1}{2} sin\ 2x$ N1



FUNGSI TRIGONOMETRI

SABAH (K2)

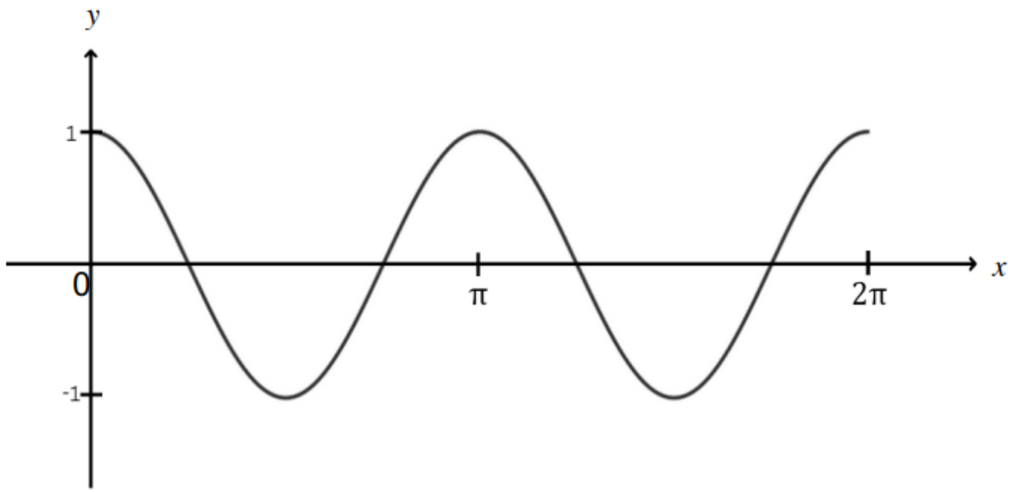
6. a) Buktikan kos $2x = 1 - 2\sin^2 x$

Prove $\cos 2x = 1 - 2\sin^2 x$

[2 markah/*marks*]

b) Rajah di bawah menunjukkan graf bagi suatu fungsi trigonometri untuk $0 \le x \le 2\pi$.

The figure below shows the graph of a trigonometric function for $0 \le x \le 2\pi$.



i) Tuliskan persamaan graf fungsi trigonometri tersebut.

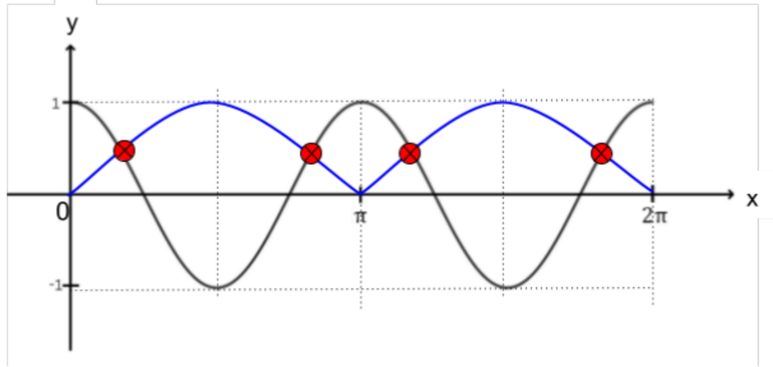
Write the equation of the graph of the trigonometric function.

[1 markah/*mark*]

ii) Dengan menggunakan paksi yang sama, lakarkan graf bagi $y = |\sin x|$ untuk $0 \le x \le 2\pi$, seterusnya cari bilangan penyelesaiannya.

By using the same axis, sketch the graph of $y = |\sin x|$ *for* $0 \le x \le 2\pi$, *then find the number of solutions.*

[3 markah/*marks*]

6	a) $\cos 2x = \cos^2 x - \sin^2 x$ $= (1 - \sin^2 x) - \sin^2 x$ $= 1 - 2\sin^2 x$ (*proven*) *OR* $= (\sin^2 x + \cos^2 x) - 2\sin^2 x$ $= \cos^2 x - \sin^2 x$ $= \cos 2x$ (*proven*)	K1 N1 *OR* K1 N1
	b) i) $y = \cos 2x$ ii)  *Shape* *graph reflected on the x-axis* *number of solutions* : 4	P1 P1 P1 N1

FUNGSI TRIGONOMETRI

SELANGOR SET 1 (K2)

2 (*a*) Terbitkan rumus sudut berganda bagi kos $2A = \text{kos}^2 A - \text{sin}^2 A$.
Derive the double angle formula of $\cos 2A = \cos^2 A - \sin^2 A$.

[2 markah]
[2 *marks*]

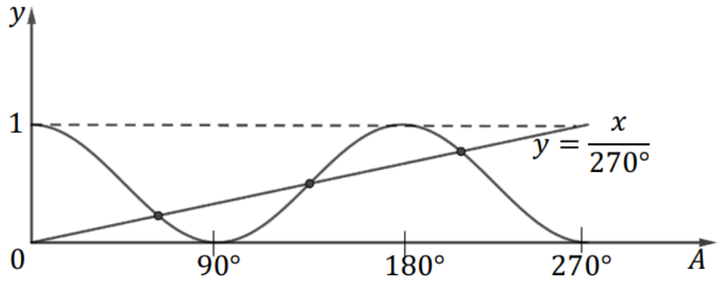
(*b*) Lakar graf bagi $y = \frac{1}{2}\text{kos } 2A + \frac{1}{2}$ untuk $0 \le A \le 270°$.

Sketch the graph of $y = \frac{1}{2}\cos 2A + \frac{1}{2}$ *for* $0 \le A \le 270°$.

Seterusnya, dengan menggunakan paksi yang sama, lakar satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $\frac{1}{2}\text{kos}^2 A - \frac{1}{2}\text{sin}^2 A = \frac{2A}{540°} - \frac{1}{2}$ untuk $0 \le A \le 270°$. Nyatakan bilangan penyelesaian itu.

Hence, using the same axes, sketch a suitable straight line to find the number of solutions to the equation $\frac{1}{2}\cos^2 A - \frac{1}{2}\sin^2 A = \frac{2A}{540°} - \frac{1}{2}$ *for* $0 \le A \le 270°$. *State the number of solutions.*

[6 markah]
[6 *marks*]

2	(*a*)		Guna $\text{kos}(A + A) = \text{kos } A \text{ kos } A - \text{sin } A \text{ sin } A$ & $\text{kos } 2A = \text{kos}^2 A - \text{sin}^2 A$	K1 N1
	(*b*)		 Bentuk graf kosinus Mak: 1, Min: 0 Anjakan ½ unit ke atas $y = \frac{x}{270°}$	P1 P1 P1 K1 K1
			Lihat Garis Lurus $y = \frac{x}{270°}$ Bilangan Penyelesaian: 3	N1

FUNGSI TRIGONOMETRI

SELANGOR SET 2 (K2)

5 (*a*) Diberi bahawa $\sin^2 x = 4\cos^2 y$, carikan sudut tirus bagi x dan y yang memenuhi persamaan $2\cos^2 x + \sin^2 y = 1$.

It is given that $\sin^2 x = 4\cos^2 y$, *find the acute angle for* x *and* y *that satisfied the equation* $2\cos^2 x + \sin^2 y = 1$.

[5 markah]
[5 *marks*]

(*b*) Gunakan kertas graf untuk menyelesaikan soalan ini.
Use the graph paper to solve this question.

Dengan menggunakan skala 2 cm kepada $\frac{\pi}{8}$ radian pada paksi–x dan 2 cm kepada 0.5 unit pada paksi–y, lukis graf $y = \sin 2x$ untuk $0 \le x \le \pi$.

By using a scale of 2 cm *to* $\frac{\pi}{8}$ *radian on the* x*–axis and* 2 cm *to* 0.5 unit *on the* y*–axis, draw the graphs of* $y = \sin 2x$ *for* $0 \le x \le \pi$.

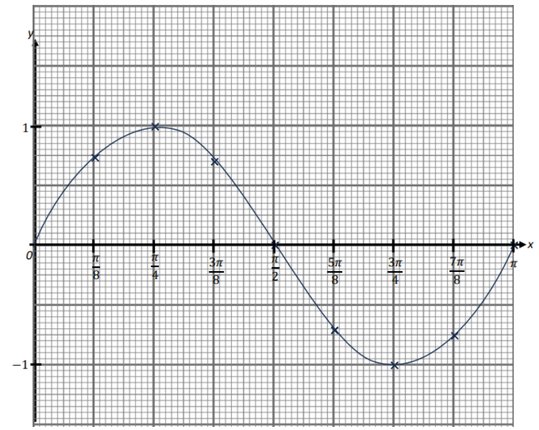
[4 markah]
[4 *marks*]

5	(a)	Guna $sin^2x = 1 - kos^2x$ @ $sin^2y = 1 - kos^2y$ ke dalam $2kos^2x + sin^2y = 1$ @ $sin^2x = 4kos^2y$	K1
		$2(1 - 4kos^2y) + (1 - kos^2y) = 1$	K1
		$y = 61.87°$	N1
		$1 - kos^2x = 4kos^2y$	K1
		$x = 70.53°$	N1
	(b)	Bagi fungsi $y = \sin 2x$	

x	0	$\frac{\pi}{8}$	$\frac{\pi}{4}$	$\frac{3\pi}{8}$	$\frac{\pi}{2}$	$\frac{5\pi}{8}$	$\frac{3\pi}{4}$	$\frac{7\pi}{8}$	π
y	0	0.71	1	0.71	0	-0.71	-1	-0.71	0

N1

- Paksi-paksi betul dan skala seragam sekurang-kurangnya satu *titik diplot dengan betul. — P1
- Semua 8 *titik diplot dengan betul dan kelihatan bentuk graf $y = \sin x$. — P1
- Graf $y = \sin x$ dilukis dengan betul. — P1



SELANGOR SET 2 (K2)

FUNGSI TRIGONOMETRI

4 (*a*) (i) Buktikan $\tan\frac{x}{2}=\frac{1-\text{k}\cos x}{\sin x}$. [2 *markah*]

Prove $\tan\frac{x}{2}=\frac{1-\cos x}{\sin x}$ [2 *marks*]

(ii) Seterusnya, selesaikan $\tan\frac{x}{2}+\sin x=0$ bagi $0\le x\le 2\pi$. [3 *markah*]

Hence, solve $\tan\frac{x}{2}+\sin x=0$ *for* $0\le x\le 2\pi$. [3 *marks*]

(*b*) Diberi $\sin\theta=m$ bagi $0\le\theta\le\pi$, ungkapkan $\sin^2\frac{\theta}{2}$ dalam sebutan *m*. [3 *markah*]

It is given $\sin\theta=m$ *for* $0\le\theta\le\pi$, *express* $\sin^2\frac{\theta}{2}$ *in terms of m.* [3 *marks*]

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4 (*a*) (i)

$$\frac{1-\cos x}{\sin x}$$

$$=\frac{1-(1-2\sin^2\frac{x}{2})}{2\sin\frac{x}{2}\cos\frac{x}{2}}$$ **K1**

$$=\frac{2\sin^2\frac{x}{2}}{2\sin\frac{x}{2}\cos\frac{x}{2}}$$

$$=\frac{\sin\frac{x}{2}}{\cos\frac{x}{2}}$$

$$=\tan\frac{x}{2}\quad (LHS=RHS)$$ **N1**

(ii) $\frac{1-\cos x}{\sin x}+\sin x=0$ &

$1-\cos x+(1-\cos^2 x)=0$ **K1**

Selesaikan $\cos^2 x+\cos x-2=0$ **K1**

$0,\ 2\pi$ **N1**

(*b*) $\sqrt{1-m^2}$ dilihat atau $-\sqrt{1-m^2}$ **P1**

Guna kos $2A$ = $\text{kos}^2 A-\sin^2 A$ @

kos $2A$ = $2\,\text{kos}^2 A-1$ @

kos $2A$ = $1-2\sin^2 A$

&

Selesaikan **K1**

$\sin^2\frac{\theta}{2}=\frac{1-\sqrt{1-m^2}}{2}$ @ $\sin^2\frac{\theta}{2}=\frac{1+\sqrt{1-m^2}}{2}$ **N1**