



KEMENTERIAN PENDIDIKAN
JABATAN PENDIDIKAN NEGERI PERAK



MODUL BLUE DIAMOND *Matematik Tambahan*

TINGKATAN 5

Bab 6

FUNGSI TRIGONOMETRI *(Trigonometry Functions)*

SKEMA JAWAPAN

JABATAN PENDIDIKAN NEGERI PERAK

We Deliver

SKEMA JAWAPAN KERTAS 1

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
1	$2(2\sin x \cos x) = -\sqrt{3}$ $2 \sin 2x = -\sqrt{3}$ $\sin 2x = -\frac{\sqrt{3}}{2}$ $2x = 240, 300, 600, 660$ $x = 120, 150, 300, 330$ N1 jika hanya betul dua nilai x	1 1 1 1	4

Sumber : Ticket To Victory 1 | Kertas 1 | Set 2 | Soalan 10

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
2	(a) $\sin 2x = -\frac{1}{2}$ $\alpha = 30^\circ$ $2x = 210^\circ, 330^\circ, 570^\circ, 690^\circ$ $x = 105^\circ, 165^\circ, 285^\circ, 345^\circ$	1 1 1 1	8
	(b) $\tan \theta = \frac{k}{18+x}$ atau $\tan 2\theta = \frac{k}{6+x}$ atau $\tan 3\theta = \frac{k}{x}$ $\frac{\tan \theta + \tan 2\theta}{1 - \tan \theta \tan 2\theta} = \frac{k}{x}$ $\frac{\left(\frac{k}{18+x}\right) + \left(\frac{k}{6+x}\right)}{1 - \left(\frac{k}{18+x}\right)\left(\frac{k}{6+x}\right)} = \frac{k}{x}$ $k = \sqrt{108 - x^2}$	1 1 1 1	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 3 | Soalan 12

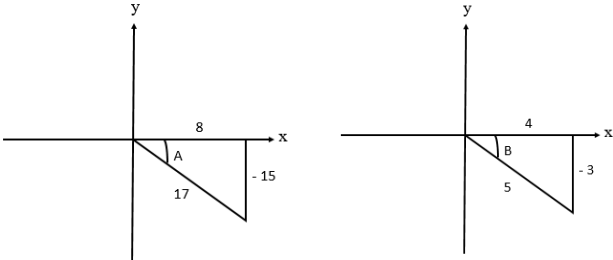
NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
3	(a) $2 \text{ p.m} = 1400$ $t = 1400$ $\pi = 180^\circ$ $\theta = 25 + 6 \cos \frac{5\pi}{12} (t - 4)$ $= 25 + 6 \cos \frac{5(180)}{12} (14 - 4)$ $= 30.20^\circ \text{ C}$	 1 1	

(b)	suhu adalah minimum apabila $\cos \frac{5\pi}{12} (t - 4) = -1$ $\frac{5\pi}{12} (t - 4) = \pi$ $t = 6.4$ masa pada jam 0624	1	
		1	4

Sumber : Ticket To Victory 2 | Kertas 1 | Set11 | Soalan 6

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
4	(a) dalam ΔOAB, $\sin \theta = \frac{AB}{OA}$ $= \frac{p}{1}$ $= p$ menggunakan teori Pythagoras, $OB^2 = AB^2 + OA^2$ $1^2 = p^2 + q^2$ $1 = \sin^2 \theta + \cos^2 \theta$ $\therefore \sin^2 \theta + \cos^2 \theta = 1$	1	
		1	
		1	
	(b) $\frac{1 - \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 - \sin \theta} = \frac{(1 - \sin \theta)^2 + (\cos \theta)^2}{\cos \theta (1 - \sin \theta)}$ $= \frac{1 - 2 \sin \theta + \sin^2 \theta + \cos^2 \theta}{\cos \theta (1 - \sin \theta)}$ $= \frac{1 - 2 \sin \theta + 1}{\cos \theta (1 - \sin \theta)}$ $= \frac{2 - 2 \sin \theta}{\cos \theta (1 - \sin \theta)}$ $= \frac{2(1 - \sin \theta)}{\cos \theta (1 - \sin \theta)}$ $= \frac{2}{\cos \theta}$ $= 2 \sec \theta$	1	
		1	
		1	
		1	7

Sumber : Ticket To Victory 2 | Kertas 1 | Set 2 | Soalan 8

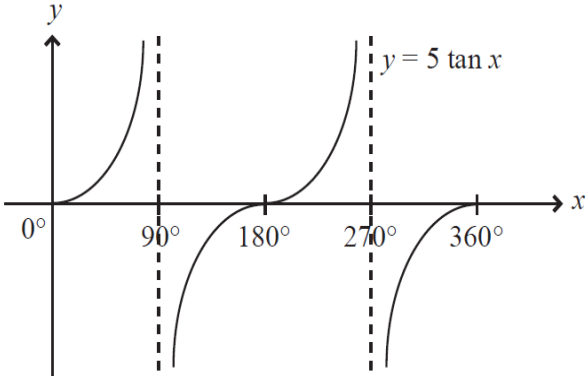
NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
5	Dalam sukuan iv  $\sin A = -\frac{15}{17}, \tan A = -\frac{15}{8}$ $\sin B = -\frac{3}{5}, \cos B = \frac{4}{5}$ $\tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$ $= \frac{-\frac{15}{8} - (-\frac{3}{4})}{1 + (-\frac{15}{8})(-\frac{3}{4})}$ $= \frac{(-\frac{9}{8})}{(\frac{77}{32})}$ $= -\frac{36}{77}$	1 1 1	
	$\sin \left(\frac{1}{2} A \right) = \sqrt{\frac{1 - \cos A}{2}}$ $= \sqrt{\frac{1 - \frac{4}{5}}{2}}$ $= \frac{3}{\sqrt{34}}$ $\operatorname{kosek} \left(\frac{1}{2} A \right) = \frac{1}{\left(\sin \frac{1}{2} A \right)}$ $= \frac{\sqrt{34}}{3}$	1 1	5

Sumber : Modul Gempur | Kertas 1 | Set 1 | Soalan 11

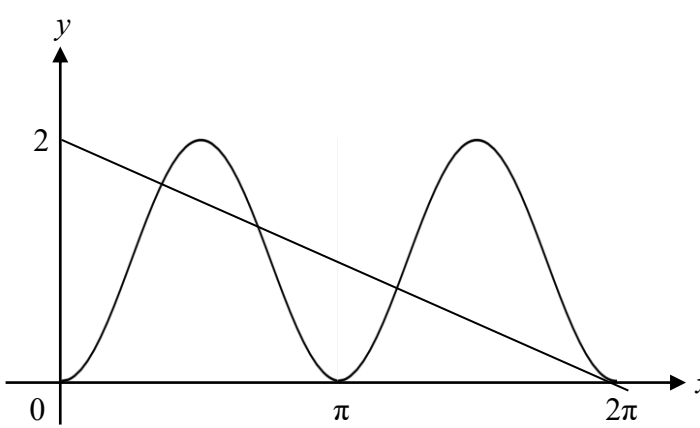
NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
6	(a) $\cos(A + B) = \cos A \cos B - \sin A \sin B$ Jika gantikan B dengan A $\cos(A + A) = \cos A \cos A - \sin A \sin A$ $\cos 2A = \cos^2 A - \sin^2 A$	1 1	6
	(b) $3 \cos^2 x - 3 \sin^2 x = 8 \sin x \cos x$ $3(\cos^2 x - \sin^2 x) = 4(2 \sin x \cos x)$ $3(\cos 2x) = 4(\sin 2x)$ $\frac{\sin 2A}{\cos 2A} = \frac{3}{4}$ $\tan 2x = 0.75$ $x = 18.435^\circ, 108.435^\circ$	1 1 1 1	

Sumber : Modul Gempur | Kertas 1 | Set 2 | Soalan 11

SKEMA JAWAPAN KERTAS 2

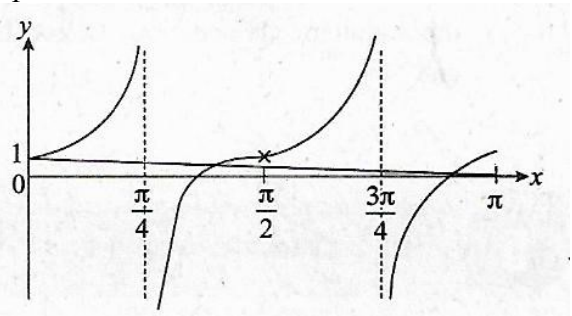
NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
1	(a) 	3	7
	(b) $3(1 - 2\sin^2 x) = 8\sin x - 5$ $(3\sin x - 2)(\sin x + 2) = 0$ 41.81° $41.81^\circ, 138.19^\circ$	1 1 1 1	

Sumber : Ticket To Victory 1 | Kertas 2 | Set 2 | Soalan 1

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
2	(a) $\frac{\sin^2 x}{\cos^2 x} - \frac{\cos^2 x}{\sin^2 x}$ $\frac{\sin^2 x - \cos^2 x}{\sin^2 x \cos^2 x}$ Permudahkan dan memperoleh $\sec^2 x - \csc^2 x$	1 1 1	8
			
	Bentuk kosinus Amplitud Bilangan kitaran Garis lurus $y = 2 - \frac{x}{\pi}$ Bilangan penyelesaian = 4	1 1 1 1 1	

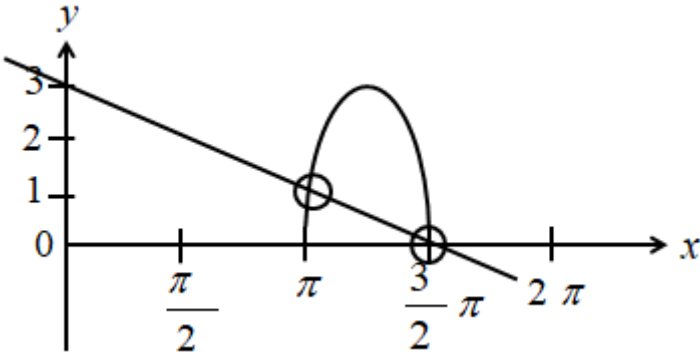
Sumber : Ticket To Victory 1 | Kertas 2 | Set 3 | Soalan 4

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
3	(a) $\frac{\tan x + \tan x}{1 - \tan x \tan x}$ $\tan 2x$	1 1	

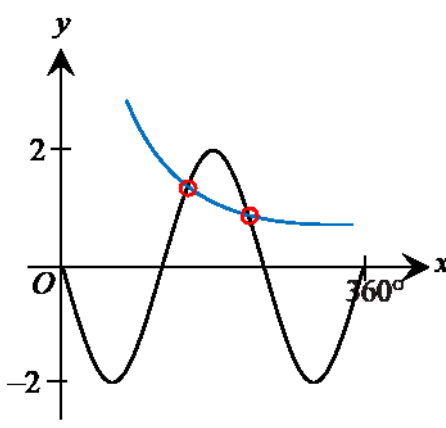
	(i) Bentuk graf tangen <i>Shape of tangent graph</i> 1 kitaran <i>1 cycle</i> Anjakan 1 unit ke atas <i>Shift up 1 unit</i>  (b) (ii) $y = 1 - \frac{x}{\pi}$ Titik (0,1), (pi,0) & kecerunan negatif <i>Point (0,1), (pi,0) & negative gradient</i> Bilangan penyelesaian = 3 <i>Number of solutions = 3</i>	1 1 1 1 1 1	8
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Sumber : Ticket To Victory 2 | Kertas 2 | Set 1 / Soalan 4

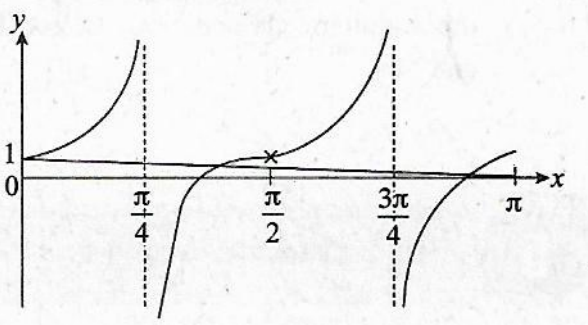
NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
4	(a) LHS, $= \sec^4 A (1 - \sin^4 A) - 2 \tan^2 A$ $= \sec^4 A - \sec^4 A \sin^4 A - 2 \tan^2 A$ $= \sec^4 A - \frac{\cos^4 A}{\sin^4 A} - 2 \tan^2 A$ $= \sec^4 A - \tan^4 A - 2 \tan^2 A$ $= [(\sec^2 A)^2 - (\tan^2 A)^2] - 2 \tan^2 A$ $= [(\sec^2 A) - (\tan^2 A)][(\sec^2 A) + (\tan^2 A)] - 2 \tan^2 A$ $\sec^2 A - \tan^2 A = 1$ SO,	1 1	

	$= \sec^2 A + \tan^2 A - 2 \tan^2 A$ $= \sec^2 A - \tan^2 A$ $= 1$	1	
(b)	$y = 3 \sin 2x$ $3\pi \sin 2x + 2x = 3\pi$ $3\pi \sin 2x = 3\pi - 2x$ $3 \sin 2x = 3 - \frac{2x}{\pi}$ $y = 3 - \frac{2x}{\pi}$  Lukis garis lurus atas graf Bilangan penyelesaian = 2	1 1 1	7

Sumber : Ticket To Victory 2 | Kertas 2 | Set 2 | Soalan 10

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
5	(a) $\cos 2A = 2\cos^2 A - 1$ $= 2\left(\frac{1}{5}\right)^2 - 1$ $= -\frac{23}{25}$	1 1 1	9
	(b) 	Bentuk – 1 Amplitud-1 Sudut-1	
	$x \sin \frac{3}{2}x = -\frac{\pi}{2}$ $-2 \sin \frac{3}{2}x = \frac{\pi}{x}$ $y = \frac{\pi}{x}$	1	
	Lakar graf $y = \frac{\pi}{x}$ Bilangan penyelesaian = 2	1 1	

Sumber : Modul Gempur | Kertas 2 | Set 1 | Soalan 4

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
6	(a) $\frac{\tan A + \tan A}{1 - \tan A \tan A}$ $\tan 2A$	1 1	9
	(b) (i)  Bentuk graf tangen 1 kitaran Anjakan 1 unit ke atas	1 1 1,1	
	$y = 1 - \frac{x}{\pi}$ Garis dengan pintasan $y = 1$ atau dengan kecerunan negatif Bilangan penyelesaian = 3	1 1 1	

Sumber : Modul Gempur | Kertas 2 | Set 1 | Soalan 7