

3472/1
Matematik
Tambahan
Kertas 1
2 Jam



KEMENTERIAN PENDIDIKAN
JABATAN PENDIDIKAN NEGERI PERAK

SEKTOR PEMBELAJARAN NEGERI PERAK
JABATAN PENDIDIKAN NEGERI PERAK
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SKEMA JAWAPAN MODUL GEMPUR SPM
TAHUN 2022

MATEMATIK TAMBAHAN
Kertas 1
Set 2
Dua Jam

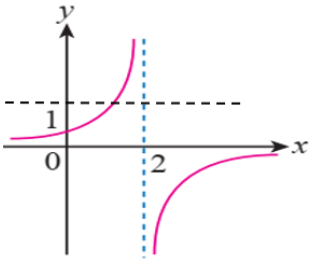
SOALAN	BUTIRAN	MARKAH	JUMLAH
1	$x^2 + 8x + 32 = 16 - px$ $x^2 + (8 + p)x + 16 = 0$ $(8 + p)^2 - 4(1)(16) \geq 0$ $p^2 + 16p \geq 0$ $p(p + 16) \geq 0$ $p \leq -16 @ p \geq 0$ <ul style="list-style-type: none"> Lakaran graf atau nombor garis atau jadual 	 1 1 1 1	4

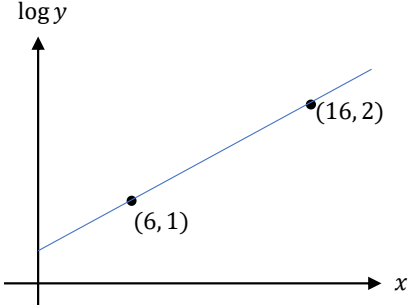
SOALAN	BUTIRAN	MARKAH	JUMLAH
2	$y = \frac{(3x+1)^2}{(1-2x)}$ $u = (3x + 1)^2 \quad \text{dan} \quad v = 1 - 2x$ Maka, $\frac{du}{dx} = 2(3x + 1)(3)$, $\frac{dv}{dx} = -2$ $= 6(3x + 1)$ $\frac{du}{dx} = v \frac{du}{dx} - u \frac{dv}{dx}$ $= \frac{(1 - 2x)[6(3x + 1)] - (3x + 1)^2(-2)}{(1 - 2x)^2}$ $= \frac{2(3x + 1)(4 - 3x)}{(1 - 2x)^2}$	 1 1 1	3

SOALAN	BUTIRAN	MARKAH	JUMLAH
3	$\frac{75 - \mu}{\sigma} = 1.281 \quad \text{atau} \quad \frac{40 - \mu}{\sigma} = 0.385$ $75 - \mu = 1.281\sigma \quad \text{--(1)}$ $40 - \mu = 0.385\sigma \quad \text{--(2)}$ $75 - (40 - 0.385\sigma) = 1.281\sigma$ $\sigma = 39.06$ Ganti $\sigma = 39.06$ into eq (1) or (2) and solve $\mu = 24.96$	 1 1 1 1 1	5

SOALAN	BUTIRAN	MARKAH	JUMLAH
4(a)	$r_1 = \frac{192p^2}{768p} = \frac{1}{4}p$ $r_2 = \frac{48p^3}{192p^2} = \frac{1}{4}p$ $r_3 = \frac{12p^4}{48p^3} = \frac{1}{4}p$ <p>Jujukan ini ialah janjang geomerti kerana nisbah sepunya, r adalah sama.</p>	1 1	
(b)	<p>Ben:</p> $36000 = 18000 + (n - 1)(1800)$ $n = 11$ <p>Jumlah gaji = $\frac{11}{2}[2(18000) + (11-1)(1800)] + 4(36000)$</p> <p>Jumlah gaji = 441000</p> <p>Kent:</p> $36000 = a + (15 - 1)(1000)$ $a = 22000$ <p>Jumlah gaji = $\frac{15}{2}[2(22000) + (15-1)(1000)]$</p> <p>Jumlah gaji = 435000</p> <p>Ben menerima jumlah gaji yang lebih</p>	1 1 1 1 1	7

SOALAN	BUTIRAN	MARKAH	JUMLAH
5 (a)	$(8 - 2k)(5k)$ <p>Berjaya Buktikan, Luas Q = $-10k^2 + 40k$</p> $k = 2$	1 1 1	
(b)	$(8)^3 - (4)^3$ <p>408</p>	1 1	

SOALAN	BUTIRAN	MARKAH	JUMLAH
6 (a)	 <p data-bbox="229 417 861 533">Apabila ujian garis mengufuk dilakukan, garis mengufuk memotong graf f hanya pada satu titik. Ini bermaksud jenis fungsi f ini ialah fungsi satu dengan satu. Maka, fungsi f mempunyai fungsi songsang.</p>	1	
(b)(i)	$y = \frac{2}{2-x}$ $2y - xy = 2$ $x = \frac{2y-2}{y}$ $f^{-1}(x) = \frac{2x-2}{x}, x \neq 0$	1 1	5
(ii)	$f^{-1}(-6) = \frac{2(-6)-2}{(-6)}$ $= \frac{7}{3}$	1 1	

SOALAN	BUTIRAN	MARKAH	JUMLAH
7(a)	 <ul style="list-style-type: none"> • Paksi dilukis dengan betul $\log_{10} y$ melawan x dan garis lurus dilukiskan. • Apabila $x = 6$, $\log_{10} 10 = 1$. (6, 1) Apabila $x = 16$, $\log_{10} 100 = 2$. (16, 2) Titik (6, 1) dan (16, 2) diplotkan 	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	5
(b)	$y = pq^x$ $\log_{10} y = \log_{10} pq^x$ $\log_{10} y = \log_{10} p + (\log_{10} q)x$ $\log_{10} q = \frac{2-1}{16-6} = 0.1$ $q = 1.259$ $1 = \log_{10} p + 0.1(6)$ $\log_{10} p = 0.4$ $p = 2.512$	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	

SOALAN	BUTIRAN	MARKAH	JUMLAH
8 (a)	$25(5^{2x-3}) = 1$ $(5^{2x-3}) = \frac{1}{25}$ $(5^{2x-3}) = \frac{1}{5^2}$ $(5^{2x-3}) = 5^{-2}$ $(5^{2x-3}) = 5^{-2}$ $2x - 3 = -2$ $x = \frac{1}{2}$	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	
(b)	<p><i>Faktorkan</i>, $xy^2 + x^2y = xy(y + x)$</p> $xy = \frac{1}{4 + 3\sqrt{2}} \times \frac{1}{4 - 3\sqrt{2}}$ $= \frac{1}{4^2 - (3\sqrt{2})^2}$ $= \frac{1}{16 - 18}$ $= -\frac{1}{2}$ $y + x = \frac{1}{4 - 3\sqrt{2}} + \frac{1}{4 + 3\sqrt{2}}$ $= \frac{4 + 3\sqrt{2} + 4 - 3\sqrt{2}}{(4 - 3\sqrt{2})(4 + 3\sqrt{2})}$ $= \frac{8}{4^2 - 9(2)}$ $= -4$ <p>Maka ,</p> $xy^2 + x^2y = xy(y + x)$ $= -\frac{1}{2} (-4)$ $= 2$	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>	6

SOALAN	BUTIRAN	MARKAH	JUMLAH
9	$\angle AOB = \frac{60^0}{180^0} \times \pi$ $= \frac{\pi}{3} \text{ rad}$ <p>Luas /Area of shaded region</p> $= 3 \times \frac{1}{2} \left(\frac{r}{3} \right)^2 \left(\frac{\pi}{3} - \sin 60^0 \right)$ $= \frac{r^2}{6} \left(\frac{\pi}{3} - \frac{\sqrt{3}}{2} \right)$ $= \left(\frac{\pi}{18} - \frac{\sqrt{3}}{12} \right) r^2 \text{ cm}^2$ <p>When $r=30\text{cm}$,</p> $\text{Area} = \left(\frac{\pi}{18} - \frac{\sqrt{3}}{12} \right) (30)^2 \text{ cm}^2$ $= 27.196/ 27.20 \text{ cm}^2$	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	6

SOALAN	BUTIRAN	MARKAH	JUMLAH
10(a)(i)	$\overrightarrow{KR} = x - y$	1	7
(ii)	$\overrightarrow{SM} = 4y + \frac{3}{4}(-4y + x)$ $= y + \frac{3}{4}x$	1	
(b)	$\overrightarrow{SM} = q(\overrightarrow{SP} + \overrightarrow{PQ})$ $y + \frac{3}{4}x = q(4y + px - 2y)$ $y + \frac{3}{4}x = 2qy + pqx$ $2q = 1$ $q = \frac{1}{2}$ $pq = \frac{3}{4}$ $p = \frac{3}{2}$	1	

SOALAN		BUTIRAN	MARKAH	JUMLAH
11	(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)	$3 \cos^2 x - 3 \sin^2 x = 8 \sin x \cos x$ $3(\cos^2 x - \sin^2 x) = 4(2 \sin x \cos x)$ $3(\cos 2x) = 4(\sin 2x)$ $\frac{\sin 2A}{\cos 2A} = \frac{3}{4}$ $\tan 2x = 0.75$ $x = 18.44^\circ, 108.44^\circ, 198.44^\circ, 288.44^\circ$	1 1 1 1	

SOALAN		BUTIRAN	MARKAH	JUMLAH
12(a)		6x4 24	1 1	5
(b)		$\frac{{}^8P_6}{2(6)}$ or $\frac{{}^8P_7}{2(7)}$ or $\frac{{}^8P_8}{2(8)}$ $\frac{{}^8P_6}{2(6)} + \frac{{}^8P_7}{2(7)} + \frac{{}^8P_8}{2(8)}$ 7080	1 1 1	

SOALAN		BUTIRAN	MARKAH	JUMLAH
13 (a)		$m = 1$ dan $n = 1$	1	8
(b)		$\left(\frac{2k+7k}{2}, \frac{4k+k}{2}\right)$ atau $\left(\frac{(2k)(1)+(7k)(1)}{1+1}, \frac{(4k)(1)+(k)(1)}{1+1}\right)$ $h+k = \frac{4k+k}{2}$ $h = \frac{3}{2}k$	1 1 1	
(c)		$h = 3$ atau $k = 2$ $\frac{1}{2} \left \left[(4)(2) + (14)(L-2) + (8)(2) + (0)(8) \right] - \left[(4)(2) + (0)(L-2) + (8)(2) + (14)(8) \right] \right = 105$ $14L - 140 = \pm 210$ $L = 25, L = -5$ $S(8, -7)$	1 1 1 1	

SOALAN	BUTIRAN	MARKAH	JUMLAH
14(a)	Isi pada = 32π $\pi r^2 h = 32\pi$ $h = \frac{32}{x^2}$ Jumlah luas permukaan $\pi r s + \pi r^2 + 2\pi r h$ $\pi(x)(3x) + \pi(x)^2 + 2\pi(x)\left(\frac{32}{x^2}\right)$ $4\pi x^2 + \frac{64\pi}{x}$ $4\pi\left(x^2 + \frac{16}{x}\right)$	 1 1 1	
(b)	$\frac{dL}{dx} = 0$ $\frac{dL}{dx} = 8\pi x - \frac{64\pi}{x^2}$ $8\pi x - \frac{64\pi}{x^2} = 0$ $x = 2$	 1 1	8
(c)	Petua rantai $\frac{dL}{dt} = \frac{dL}{dx} \times \frac{dx}{dt}$ atau setara $42\pi = \left(8\pi x - \frac{64\pi}{x^2}\right) \times \frac{dx}{dt}$ Gantikan $x = 4$ $42\pi = \left[8\pi(4) - \frac{64\pi}{(4)^2}\right] \times \frac{dx}{dt}$ $\frac{dx}{dt} = 1.5 \text{ cms}^{-1}$	 1 1 1	

