PERATURAN PEMARKAHAN
MATEMATIK TAMBAHAN
KERTAS 1
UJIAN DIAGNOSTIK TINGKATAN 5 TAHUN 2021

NO.	SOLUTION AND MARK SCHEME	SUB MARKS	TOTAL MARKS
1. (a)	$p = -3$	1	
	Hasil darab punca = -9	1	
(b)	$6 + 5x - x^2 < 0$	1	5
	$(x - 6)(x + 1) > 0$	1	
	$x < -1$ dan $x > 6$	1	
2. (a)	$\frac{6-\sqrt{3}}{9-\sqrt{12}} \times \frac{9+\sqrt{12}}{9+\sqrt{12}} = \frac{54+6\sqrt{12}-9\sqrt{3}-\sqrt{36}}{81-12}$	1	
	$= \frac{54+12\sqrt{3}-9\sqrt{3}-6}{69}$		
	$= \frac{48+3\sqrt{3}}{69}$		
	$= \frac{16+\sqrt{3}}{23}$	1	
(b)	$1500 + e^{0.9t} > 9500$	1	5
	$e^{0.9t} > 8000$		
	$\ln e^{0.9t} > \ln 8000$		
	$0.9 t \ln e > \ln 8000$ (1)	1	
	$t > \frac{\ln 8000}{0.9}$		
	$t > 9.986$		
	$t = 10$ (1)	1	
3. (a)	$a^3 x + a^2 b + ab + b$ atau $a^2 x + ab + b$	1	
	$a^3 = 64$ or $16b + 4b + b = -42$	1	
	$a = 4$, $b = -2$	1 ,1	6
(b)	$f^{-1} = \frac{187 - x}{0.85}$	1	
	153	1	

4.	$y + 4 + (x + 10) + 5x = 44$ $6x + y = 30$ ………………………….. (1) $(5x)^2 = y^2 + (x + 6)^2$ $24x^2 - y^2 - 12x - 36 = 0$ ………. (2) $\Bigg\}$ ATAU $24x^2 - (30 - 6x)^2 - 12x - 36 = 0$ $12x^2 - 348x + 936 = 0$ $(x - 26)(x - 3) = 0$ $x = 26, \ \ x = 3$ $y = -126$ (abaikan) $\ \ y = 12$ Luas $= \frac{1}{2}[4 + (3 + 10)] \times (12)$ $\qquad = 102 \text{ m}^2$	1 1 1 1 1	5

5. (a)	$\sin\frac{\theta}{2} = \frac{6}{10}$ $\theta = 1.287$	1	
(b)	Perimeter $= 2 \times 12 + 2\left[10 \times (\frac{2\pi - 2.574}{2})\right]$ 61.092 cm $3.142(10)^2 - 2\left[\frac{1}{2}(10^2)(1.287) - \frac{1}{2}(10^2)(\sin 73.74)\right]$ or $3.142(10)^2 - 2\left(\frac{1}{2}\right)(10^2)(1.287 - \sin 1.287)$ 281.4999 cm^2	1 1 1 1	5

6. (a)	$\frac{dy}{dx} = -18(2x - 1)^{-4}$ atau $\frac{-18}{(2x-1)^4}$ $\frac{dy}{dx} = -\frac{2}{9}$	1 1	4
(b)	$\delta y = -\frac{2}{9} \times k$ Penyusutan	1 1	
	-5	1	6

7. (a)	$\int_1^3 g(x)\,dx + \int_1^3 4\,dx$		
	$5 + [4x]_1^3$	1	
	13	1	
(b)	$\int 5x - 2\,dx$		
	$y = \dfrac{5x^2}{2} - 2x + c$	1	
	$c = 4$	1	
	$y = \dfrac{5x^2}{2} - 2x + 4$	1	
8. (a)	$log_{10}y = (-log_{10}3)x + log_{10}h$ $Y = log_{10}y$, $X = x$, $m = (-log_{10}3)$, $c = log_{10}h$	1,1,1,1	
(b)	$log_{10}h = -1$	1	**6**
	$h = \dfrac{1}{10}$	1	
9. (a)	$\overrightarrow{AC} = 6\boldsymbol{q} + 3\boldsymbol{p}$	1	
	$\left|\overrightarrow{AC}\right| = \sqrt{6^2 + 3^2}$		
	$\sqrt{45}$ units	1	
(b)	$\overrightarrow{AE} = 6\boldsymbol{p} + 4\boldsymbol{q}$ ATAU $\overrightarrow{CD} = 3\boldsymbol{p} - 6\boldsymbol{q}$	1	**5**
	$\overrightarrow{FE} = \frac{1}{2}(3\boldsymbol{p} - 6\boldsymbol{q}\ ) + 4\boldsymbol{q}$ ATAU $\overrightarrow{AF} = 6\boldsymbol{p} + \frac{1}{2}(6\boldsymbol{q} - 3\boldsymbol{p})$		
	$= \frac{1}{4}(6\boldsymbol{p} + 4\boldsymbol{q}) = \frac{1}{4}\overrightarrow{AE}$	1	
	A, F and E are collinear.	1	
10.(a)	$18 - (12 - x) = 4x - 18$	1	
	$x = 8$	1	
(b)	$36 + h + k = 52$ @ $h + k = 16$	1	**5**
	ATAU $\dfrac{h}{36} = \dfrac{k}{h}$		
	$h + \dfrac{h^2}{36} = -8$	1	
	$h = 12$, $k = 4$	1	

11.(a)	$\dfrac{1}{p}$	1	
	$\sin 2\theta = -2p\sqrt{1-p^2}$ $2p\cos\theta$ or $-2\sin\theta\,(-\sqrt{1-p^2})$	1 1	
(b)	$3(1-\text{kos}^2 x)+ \text{kos}-1=0$ $(3\text{ kos } x + 2)(\text{kos } x - 1) = 0$ $0°, 131°\,49'$, $228°\,11'$,$360°$ or $0°, 131.81°, 228.91°$,$360°$	1 1 1	**6**
12.(a)	$\dfrac{m!}{(m-2)!\,2!} = 15$ $\dfrac{m^2 - m}{2} = 15$ $(m-6)(m+5) = 0$ $\therefore m = 6$	1 1 1	
(b)	$\dfrac{6!}{(6-r)!\,r!} = 5\left[\dfrac{4!}{(4-r)!\,r!}\right]$ $\dfrac{6 \times 5 \times 4!}{(6-r)(5-r)(4-r)!\,r!} = 5\left[\dfrac{4!}{(4-r)!\,r!}\right]$ $\dfrac{6}{(6-r)(5-r)} = 1$ $(r-3)(r-8) = 0$ $r = 3 , 8$ $\therefore r = 3$	1 1 1	**6**

13.	(a) $x = \dfrac{(2)(-1)+(1)(5)}{3}$ @ $y = \dfrac{(2)(4)+(1)(7)}{3}$)	1	
	$L = (1, 5)$	1	
	(b) $m_{KM} = \dfrac{1}{2}$, then $m_{LN} = -2$	1	
	$y = -2x + 7$ & $y = 3x - 8$	1	
	$N(3,1)$	1	**8**
	(c) $\dfrac{1}{2}\begin{vmatrix} -1 & 3 & 5 & -1 \\ 4 & 1 & 7 & 4 \end{vmatrix} = \dfrac{1}{2}(-1+21+20+7-5-12)$	1 , 1	
	$= 15$	1	
14. (a)	Bank A $S_8 = \dfrac{45000(1.05^8 - 1)}{1.05 - 1}$	1	
	$= 429\,710$	1	
	Bank B $S_8 = \dfrac{8}{2}[2(47000) + (8-1)2000]$	1	
		1	
	$= 432\,000$		**8**
	Bank B kerana jumlah gaji terkumpul untuk 8 tahun lebih tinggi	1	
(b)	Tabung pelajaran = 15% x 432 000	1	
	$= 64\,800$	1	
	Cukup kerana tabungan melebihi yuran / masih ada baki RM4800.	1	
15. (a)	0.0808	1	
	0.5 – 0.1628 -0.0808	1	
	0.2564	1	
(b)	P= 0.25 q= 0.75	1	**8**
	$10C_0(0.25)^0 (0.75)^{10} + 10C_1(0.25)^1 (0.75)^9$ 0.2440	1 1	
	$10C_0(0.25)^0 (0.75)^{10} + 10C_1(0.25)^1 (0.75)^9 +$ $10C_2(0.25)^2 (0.75)^8$	1	

0.5256	1	
	Jumlah	**80**