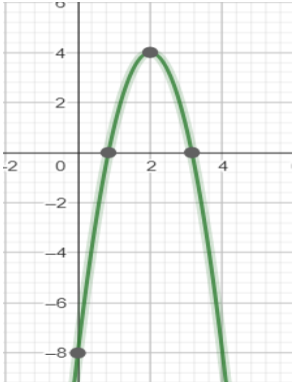
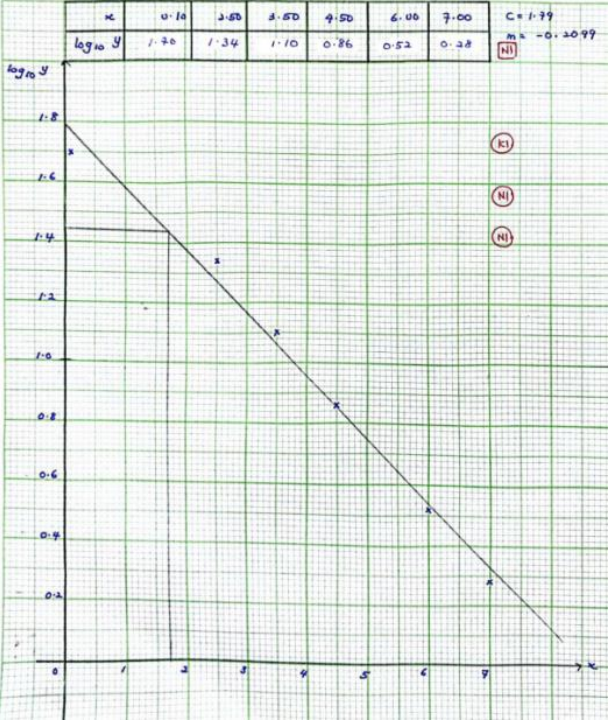


SKEMA PEMARKAHAN KERTAS MODUL GUNA SAMA PERCUBAAN SPM 2024 BATU PAHAT SET A

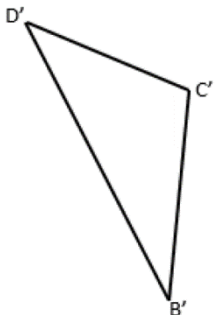
no	Skema pemarkahan				Markah
1	1a	Ketiga-tiga satah berada dalam satu garis lurus	P1		6
	1b	Menghapuskan salah satu pemboleh ubah dengan menggunakan kaedah penggantian atau penghapusan	P1		
		- menyamakan pekali bagi salah satu anu atau menjadikan salah satu anu sebagai perkara rumus			
		- hasil penggantian atau penghapusan yang betul	K1		
		- penghapusan kali kedua dilakukan dengan betul	K1		
		$6 - p - 11 = 0$	K1		
		$p = 5$	N1		
2	2a	$k = 4$	N1		7
		Penggantian $(0, -8)$ dalam fungsi $f(x)$ betul			
		$-8 = a(0 - 2)^2 + 4$	K1		
		$a = -3$	N1		
	2b				
		Bentuk $\cap$ betul	P1		
		Titik maksimum $(2, 4)$ diplot dengan betul	N1		
		Titik $(0, -8)$ dan $(4, -8)$ diplot dengan betul	N1		
		Terima salah satu pernyataan yang betul daripada			
		- graf bergerak ke bawah sebanyak 8 unit.			
		- paksi simetri, $x = 2$ tidak berubah.			
		- Titik maksimum menjadi $(2, -4)$	P1		
3	a.	Guna hukum segitiga untuk mencari $\overrightarrow{AD}$ and $\overrightarrow{BC}$	K1		
		$\overrightarrow{AD} = 16\underset{\sim}{x} + 18\underset{\sim}{y}$	N1		
		$\overrightarrow{BC} = -16\underset{\sim}{x} + 12\underset{\sim}{y}$	N1		
	b.	$\overrightarrow{AE} = 16h\underset{\sim}{x} + 18h\underset{\sim}{y}$			
		$\overrightarrow{BE} = -16k\underset{\sim}{x} + 12k\underset{\sim}{y}$			
			Salah satu beri K1		

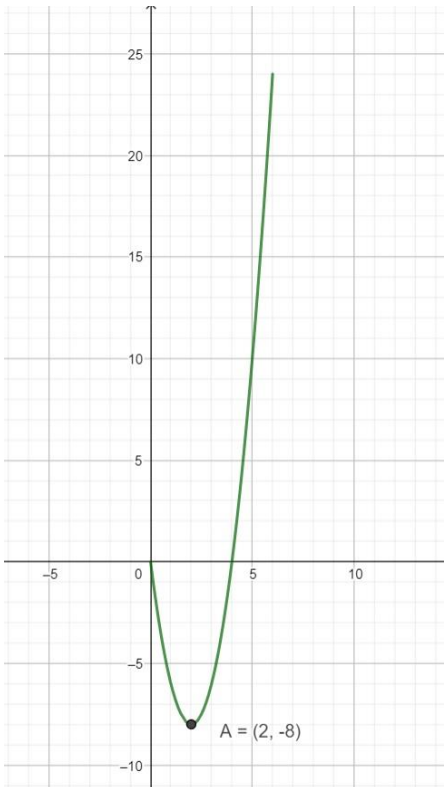
	$\overrightarrow{AE} = \overrightarrow{AB} + \overrightarrow{BE}$$16\underset{\sim}{h}\underset{\sim}{x} + 18\underset{\sim}{h}\underset{\sim}{y} = 16\underset{\sim}{x} + (-16\underset{\sim}{k}\underset{\sim}{x} + 12\underset{\sim}{k}\underset{\sim}{y})$ Bandingkan kedua-dua belah persamaan $16h = 16 - 16k$ atau $18h = 12k \quad \text{atau} \quad \frac{3}{2}h = k$ Gantikan $\frac{3}{2}h = k \text{ ke dalam } 16h = 16 - 16k$$16h = 16 - 16\left(\frac{3}{2}h\right)$$h = \frac{2}{5} \text{ dan } k = \frac{3}{5}$	K1 K1 K1 N1N1		9											
4	a) $\frac{dh}{dr} = -\frac{350}{r^3}$ $\delta h = p$ $\delta r = \frac{1}{-\frac{350}{r^3}} \times p$ $\delta r = -0.3571p$ K1 K1 K1 (r = 5) K1 N1 b) $\frac{-0.3571p}{5} \times 100\%$ $-7.142p\%$ <u>Peratusan berkurang</u> K1 N1 N1	8	8												
5	<table><tr><td>a) $36(1.08)^{15}$ 114.20</td><td> K1 N1 </td></tr><tr><td>b) $36(1.08)^t = 1000$ atau $\log_{10}(1.08)^t = \log_{10}\left(\frac{1000}{36}\right)$ $t \log_{10} 1.08 = \log_{10}\left(\frac{1000}{36}\right)$ $t = 43.19$</td><td> P1 K1 N1 </td></tr></table>	a) $36(1.08)^{15}$ 114.20	K1 N1	b) $36(1.08)^t = 1000$ atau $\log_{10}(1.08)^t = \log_{10}\left(\frac{1000}{36}\right)$ $t \log_{10} 1.08 = \log_{10}\left(\frac{1000}{36}\right)$ $t = 43.19$	P1 K1 N1		5								
a) $36(1.08)^{15}$ 114.20	K1 N1														
b) $36(1.08)^t = 1000$ atau $\log_{10}(1.08)^t = \log_{10}\left(\frac{1000}{36}\right)$ $t \log_{10} 1.08 = \log_{10}\left(\frac{1000}{36}\right)$ $t = 43.19$	P1 K1 N1														
6	<table><tr><td rowspan="2">6a (i)</td><td>Menggantikan nilai n=16 atau n=7 ke dalam rumus S_n $16(4(16) - 7)$ atau $7(4(7) - 7)$</td><td> K1 </td></tr><tr><td>765</td><td> N1 </td></tr><tr><td rowspan="3">6a(ii)</td><td>$a = -3$</td><td> N1 </td></tr><tr><td>$5 - (-3)$ atau setara</td><td> K1 </td></tr><tr><td>$d = 8$</td><td> N1 </td></tr></table>	6a (i)	Menggantikan nilai n=16 atau n=7 ke dalam rumus S_n $16(4(16) - 7)$ atau $7(4(7) - 7)$	K1	765	N1	6a(ii)	$a = -3$	N1	$5 - (-3)$ atau setara	K1	$d = 8$	N1		
6a (i)	Menggantikan nilai n=16 atau n=7 ke dalam rumus S_n $16(4(16) - 7)$ atau $7(4(7) - 7)$		K1												
	765	N1													
6a(ii)	$a = -3$	N1													
	$5 - (-3)$ atau setara	K1													
	$d = 8$	N1													

	6b	$a = 2$ atau $d = 0.5$ dilihat	P1		8										
		$2 + (15 - 1)(0.5)$	K1												
		9	N1												
7	7a	$\cos \theta = \frac{1}{\sqrt{t^2+1}}$ dilihat	P1		7										
		$\sin^2 \frac{\theta}{2} = \frac{1-\cos \theta}{2}$	K1												
		$\frac{\sqrt{t^2+1}-1}{2\sqrt{t^2+1}}$	N1												
	7b	$2 \sin x \cos x$ dilihat	K1												
		$\cos x (2 \sin x - 1) = 0$	K1												
		$x = \frac{\pi}{2}, \frac{3\pi}{2}$ atau $x = \frac{\pi}{6}, \frac{5\pi}{6} //$ $x = 90^\circ, 270^\circ$ atau $x = 30^\circ, 150^\circ$	N1												
		$x = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2} // x = 30^\circ, 90^\circ, 150^\circ, 270^\circ$	N1												
	8	8a	<table><tr><td>$\log_{10} y$</td><td>1.70</td><td>1.34</td><td>1.10</td><td>0.86</td><td>0.52</td><td>0.28</td></tr></table>			$\log_{10} y$	1.70	1.34	1.10	0.86	0.52	0.28	N1		
			$\log_{10} y$			1.70	1.34	1.10	0.86	0.52	0.28				
		K1 N1 N1													
	8b	$\log_{10} y = [\log_{10}(k + 1)]x + \log_{10} h$	P1												
	(i), (ii)	$\log_{10} h = * 1.79$ atau $\log_{10}(k + 1) = \frac{*1.79-0.86}{0-4.5}$	K1												
		$h = 61.66$	N1												
		$k = -0.3787$	N1												
	(iii)	$\log_{10} y = * 1.44$ (rujuk graf)	K1												
		$y = 27.54$	N1												

10

9	(a)(i) $= \frac{1}{2} \left \left[\frac{r}{2} \left(\frac{-r}{4} \right) + r(0) + (r+2)(-2) \right] - \left[\frac{r}{2}(0) + (r+2) \left(\frac{-r}{4} \right) + r(-2) \right] \right $ $= r^2 + 4r - 32 = 0$ $= (r - 4)(r + 8) = 0$ $r = 4$		K1 K1 N1 K1K1 N1	10
	(a) (ii) $= \frac{1}{2} [2(-1) + 4(5) + 0(-2)] - [-2(4) + (-1)(0) + 5(2)] $ $= 8 \text{ unit}^2$			
	(b) $\frac{MQ}{MR} = \frac{2}{1}$ $MQ = 2MR$ $\sqrt{(x-4)^2 + (y-(-1))^2} = 2\sqrt{(x-6)^2 + (y-0)^2}$ $3x^2 + 3y^2 - 40x - 2y + 127 = 0$ Lokus M ialah berbentuk bulatan.		P1K1 N1 N1	
10	a) $M_N = \frac{1}{4}$ $M_T = -4$ pada $Q(2,6)$ $y - 6 = -4(x - 2)$ $y = -4x + 14$	K1 N1		10
	b) Pada titik $P(0,14)$ $= \frac{1}{2} (14 + 6)(2) - \int_0^2 -x^2 + 10 dx$ $= 20 - \left[-\frac{x^3}{3} + 10x \right]_0^2$ $= 20 - \left[\left(-\frac{2^3}{3} + 10(2) \right) - 0 \right]$ $= 2\frac{2}{3} \text{ units @ } \frac{8}{3} \text{ units}$	P1 K1 K1 N1		
	c) $= \pi \int_4^{10} (10 - y) dy$ $= \pi \left[10y - \frac{y^2}{2} \right]_{64}^{10}$ $= \pi \left[\left(10(10) - \frac{(10)^2}{2} \right) - \left(10(4) - \frac{(4)^2}{2} \right) \right]$ $= \pi[(50) - (32)]$ $= 18\pi \text{ units}$	P1 K1 K1 N1		
11	a)(i) $P(x = 1) = {}^{10}C_1 \left(\frac{2}{7}\right)^1 \left(\frac{5}{7}\right)^9$ $= 0.1383$	K1 N1 K1		

	(ii) $P(x < 8) = 1 - P(x \geq 8) @ 1 - P(x = 8) - P(x = 9) - P(x = 10)$ $= 1 - {}^{10}C_8 \left(\frac{5}{7}\right)^8 \left(\frac{2}{7}\right)^2 - {}^{10}C_9 \left(\frac{5}{7}\right)^9 \left(\frac{2}{7}\right)^1 - {}^{10}C_{10} \left(\frac{5}{7}\right)^{10} \left(\frac{2}{7}\right)^0$ $= 1 - 0.2489 - 0.1383 - 0.03457$ $= 0.5782$ (b) $P(X \geq 70) = 0.05$ $P(X \geq 40) = 0.35$ $P\left(Z \geq \frac{70-\mu}{\sigma}\right) = 0.05$ $P\left(Z \geq \frac{40-\mu}{\sigma}\right) = 0.35$ $P(Z \geq 1.644) = 0.05$ $\geq 0.385) = 0.35$ $\frac{70-\mu}{\sigma} = 1.644 \dots\dots\dots (i)$ $= 0.385 \dots\dots\dots (ii)$ $\mu = 30.826$ $\sigma = 23.829$	K1 N1 N1 N1 K1 N1 N1		10
12	a) $56^\circ 35'$ $\frac{BD}{\sin 76^\circ 25'} = \frac{10.2}{\sin 56^\circ 35'}$ 11.88 b) $8.4^2 = 10^2 + 11.88^2 - 2(10)(11.88)\cos \angle ADB$ 44.12 c)  $\angle B'C'D' = 103^\circ 35'$ or equivelant d) $A_1 = \frac{1}{2}(10)(11.88) \sin 44.12^\circ$ or $A_2 = \frac{1}{2}(11.88)(10.2) \sin 47^\circ$ $A_1 + A_2 = 41.35 + 44.31$ 85.66	N1 K1 N1 K1 N1 N1 K1 K1 N1		10
13	a) Beza dan ganti $12 = -8 + 2p(5)$ $p = 2$	K1 N1		

	$-8t + 2t^2 = 0$ b) $t(-8 + 2t) = 0$ $t = 4$	K1 N1		10
	c) $-8 + 2(2)t = 0$ Ganti $t = 2$ ke dalam $v = -8t + 2t^2$ $v = 16$	K1 K1 N1		
	d)  Bentuk graf $t > 2$	N2 N1		
14	a) $\frac{130}{121} \times 100$ $= 107.44$ Menokok 7.44% b) (i) $\frac{10.50}{7.50} \times 100$ $= 140$ (ii) $\frac{x}{7.50} \times 100 = 114$	K1N1 K1 @ N1 K1 @		

	RM8.55 c) $\frac{121(5)+114(2)+3(y)}{5+2+3} = 115.7$ y = 108 d) $\frac{147.40}{115.7} \times 100$ =RM 127.40	N1 K1K1 N1 K1 N1		
				10
15	a) $x > 20$ $y \geq 15$ $x + y \leq 80$ $x \leq 3y$	P1 P1 P1 P1		
	Satu garis lurus dilukis dengan betul. <i>One straight line is drawn correctly.</i> Semua garis lurus dilukis dengan betul. <i>All straight lines are drawn correctly.</i> Rantau R dilorek dengan betul. <i>Region R is shaded correctly.</i> c) (i) $y = 30$ Julat / Range: $20 \leq x \leq 50$ (ii) Yuran / Fee = $200x + 150y$	K1 K1 N1 N1		

	Titik optimum / <i>Optimum point</i> = (60,20) Yuran maksimum / <i>Maximum fee</i> = (200 × 60) + (150 × 30) = 15 000	K1 N1		
				10