PRAKTIS BESTARI

PROJEK JAWAB UNTUK JAYA (JUJ) 2018

SIJIL PELAJARAN MALAYSIA 3472/2

ADDITIONAL MATHEMATICS

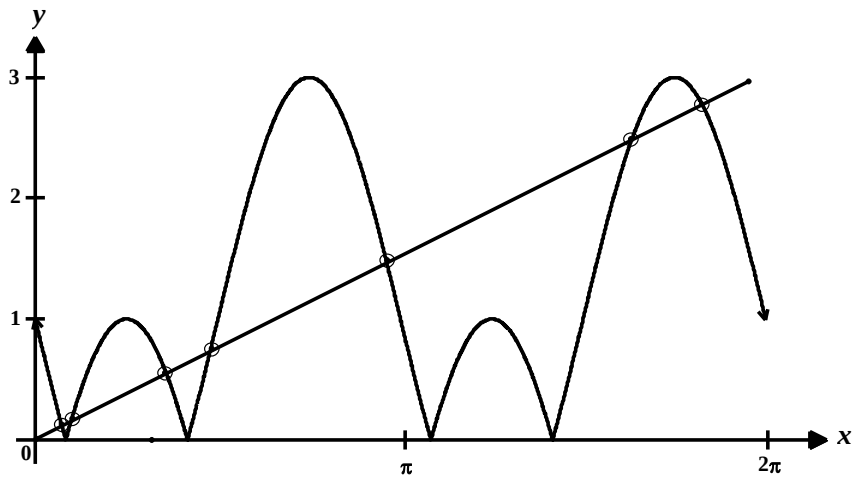
Kertas 2 / Set 2

PERATURAN PEMARKAHAN

Peraturan Pemarkahan ini mengandungi 12 halaman bercetak

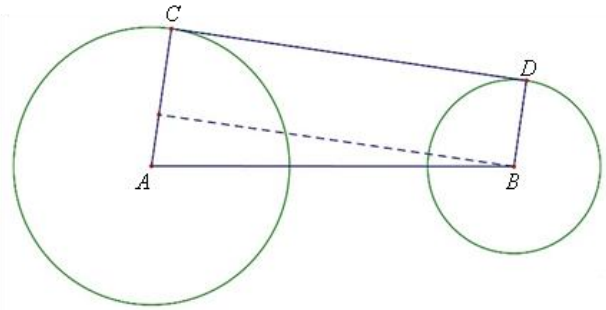
BIL	PERATURAN PEMARKAHAN	MARKAH	JUMLAH MARKAH
1	$y = 2x - 1$ OR $x = \frac{y+1}{2}$	1M	
	$6x^2 - (2x-1)^2 + 6(2x-1) - 2 = 0$ $\quad 6\left(\frac{y+1}{2}\right) - y^2 + 6y - 2 = 0$	1M	
	$x = \frac{-(16) \pm \sqrt{16^2 - 4(2)(-9)}}{2(2)}$ $\quad y = \frac{-(18) \pm \sqrt{(18)^2 4(1)(-1)}}{2(1)}$	1M	
	$y = 0.055 / 0.056$ $\quad y = -18.055 / -18.056$	1M	
	$x = 0.528$ $\quad x = -8.528$	1M	5
2	(*a*) $2^{x+4} - 2^{x+3} = 16$		
	$2^x.2^4 - 2^x.2^3 = 16$	1M	
	$2^x[16-8] = 16$	1M	
	$2^x = 2^1$		
	$x = 1$	1M	
	(*b*) $\log_x 24$		
	$= \log_x 3 \times 2^3$	1M	
	$= \log_x 3 + \log_x 2^3$		
	$= \left[\frac{\log_3 3}{\log_3 x}\right] + 2\left[\frac{\log_2 2}{\log_2 x}\right]$	1M	
	$= \frac{1}{m} + 2\left[\frac{1}{n}\right]$		
	$= \frac{1}{m} + \frac{2}{n}$	1M	6

3	(a) $y=\frac{x^{\frac{1}{2}}}{\frac{1}{2}}+c$ $y=2\sqrt{x}$ $y=2\sqrt{9}$ $Q(6,9)$ (b) Luas kawasan berlorek: $\int_0^6 x\,dy=\left[\frac{y^3}{12}\right]_0^6$ OR $\int_0^9 y\,dx=\left[\frac{2x^{\frac{3}{2}}}{\frac{3}{2}}\right]_0^6$ $\left(\frac{6}{12}^3\right)-0$ $54-\left[\left(\frac{4(9)^{\frac{3}{2}}}{3}\right)-(0)\right]$ 18	1M 1M 1M 1M 1M 1M 1M	7
4	a) $\frac{13-8}{h+3}=\frac{8-(-2)}{-3-5}$ $h=-7$ b) i) $\frac{-3(2)+x(1)}{3}=5$ or $\frac{8(2)+y(1)}{3}=-2$ $S=(21,22)$ ii) $m_2=\frac{4}{5}$ $y-22=\frac{4}{5}(x-21)$ $y=\frac{4}{5}x+\frac{194}{5}$	1M 1M 1M 1M 1M 1M 1M	8

5	(a) <table><tr><th>Mass/*Jisim* (kg)</th><th>Frequency *Kekerapan*</th><th>*Midpoint* *Titik Tengah*</th></tr><tr><td>20-29</td><td>1</td><td>24.5</td></tr><tr><td>30-39</td><td>8</td><td>34.5</td></tr><tr><td>40-49</td><td>10</td><td>44.5</td></tr><tr><td>50-59</td><td>6</td><td>54.5</td></tr><tr><td>60-69</td><td>5</td><td>64.5</td></tr></table> (b) (i) $\min = \frac{1(24.5)+8(34.5)+10(44.5)+6(54.5)+5(64.5)}{30}$ 46.5 (ii) $\sum fx^2 = 68547.5$ $\sigma^2 = \frac{68547.5}{30} - (46.5)^2$ $\sigma^2 = 122.67$ $\sigma = 11.08$	1M,1M 1M 1M 1M 1M 1M 1M 1M	8
6	 (a) Shape and cycle Amplitude and negative sin Shifted Modulus	1M 1M 1M 1M	

	(b) $y = \frac{3}{2\pi}x$ Draw line $y = \frac{3}{2\pi}x$ No of solution 7	1M 1M 1M	7
7	(a) $\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB}$ $= -8\underline{u} + 6\underline{v}$ $\overrightarrow{AF} = -8\underline{u} + 2\underline{v}$ (b) $\overrightarrow{AQ} = k\overrightarrow{AP}$ $= k\left(-8\underline{u} + 2\underline{v}\right)$ $\overrightarrow{AQ} = \overrightarrow{AB} + l\overrightarrow{BS}$ $= -8\underline{u} + 6\underline{v} + l\left(4\underline{u} - 6\underline{v}\right)$ $-8k = 4l - 8$ $6 - 6l = 2k$ $k = \frac{3}{5}$, $l = \frac{4}{5}$ (c) $\frac{1}{2} \times 8(1) \times 6(3)$ 72 (d)	1M 1M 1M 1M 1M 1M 1M 1M, 1M 1M 1M	10
8	$\frac{s}{t}$ | 35.75 | 32 | 30 | 27 | 25 | 21 (a) Plot 1 point correctly Plot all points correctly Line of the best fit (b) $\frac{s}{t} = \left(-5\sin\theta\right)\left(t\right) + v_0$ (i) $-5\sin\theta = m$ $\theta = 36.87° \pm 2°$	1M 1M 1M 1M 1M 1M 1M	

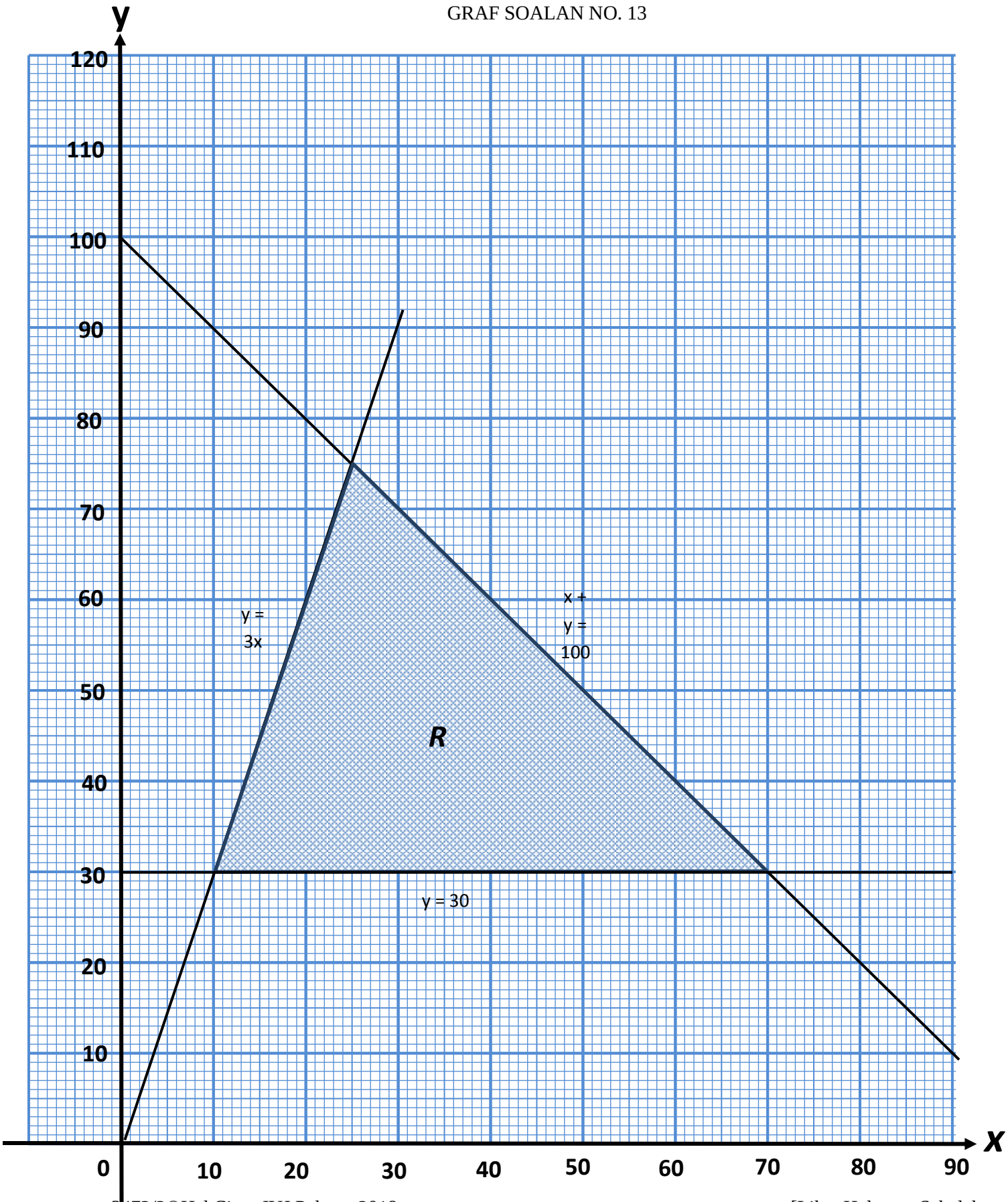
	(ii) $v_0 = c$ $v_0 = 39 \pm 0.5$ (iii) $s = 51.75$	1M 1M 1M	10
9	(a) (i) $P(X = 6) = 0.11765$ ${}^6C_6 p^6 (1-p)^0 = 0.11765$ $p^6 = 0.11765$ $6\log_{10} p = \log_{10} 0.11765$ $p = 0.7$ (ii) $p = 0.3,\ q = 0.7$ $P(X \le 2) = P(X = 0) + P(X = 1) + P(X = 2)$ $= {}^6C_0 (0.3)^0 (0.7)^6 + {}^6C_1 (0.3)^1 (0.7)^5 + {}^6C_2 (0.3)^2 (0.7)^4$ $= 0.7443$ OR P (at most 2 of them not walking) $p = 0.7,\ q = 0.3$ $P(X \ge 4) = P(X = 4) + P(X = 5) + P(X = 6)$ $= {}^6C_4 (0.7)^4 (0.3)^2 + {}^6C_5 (0.7)^5 (0.3)^1 + {}^6C_6 (0.7)^6 (0.3)^0$ $= 0.7443$ (b) (i) $P(Z < -k) = 0.1587$ @ $P(Z > k) = 0.1587$ $P(-k < Z < k) = P(-1 < Z < 1)$ $-1 = \frac{X - 38.5}{5.5} < X < 1 = \frac{X - 38.5}{5.5}$ $33 < X < 44$ (ii) $P(X > 55) = P\left(Z > \frac{55 - 38.5}{5.5}\right)$ $P(Z > 3) = 0.00135$	1M 1M 1M 1M 1M 1M OR 1M 1M 1M 1M 1M 1M 1M	10

10	(a) $r=\sqrt{12^2-(h-12)^2}$ $r=\sqrt{-h^2+24h}$ Luas $=\pi\left(\sqrt{-h^2-24h}\right)^2$ $\pi\left[24h-h^2\right]$ (b) (i) $\delta h=0.05$ $\frac{dA}{dh}=24\pi-2\pi h$ $\delta h=\left[24\pi-2\pi h\right]\left[0.05\right]$ 0.8π (ii) $\left(24\pi-2\pi h\right)\left(0.2\right)$ 4π	1M 1M 1M 1M 1M 1M 1M 1M 1M 1M	10
11	 a) $\angle CAF=2\left(kos^{-1}\left(\frac{3}{21}\right)\right)$ $=2\left(\frac{81.79^0\times 3.142}{180^0}\right)$ $=2.856$ rad b) Panjang CD/FE = $21\times\sin 81.79^0$ $=20.78$ Panjang lengkok bulatan besar = $8(2.856)$ $= 22.85$	1M 1M 1M 1M 1M	

	Panjang lengkok bulatan kecil = $5(2.855)$ $=14.275$ Perimeter = $2(20.78)+22.85+14.275$ $= 78.685$ c) Luas= $2\left(\frac{1}{2}(5+8)(21)\right)-\frac{1}{2}(8)^2(2.856)-\frac{1}{2}(5)^2(3.429)$ $= 138.75\ \text{cm}^2$.	1M 1M 1M,1M 1M	10
12	(a) i) Luas $= \frac{1}{2}\times 10\times 17\times \sin 85°$ $= 84.68\ \text{cm}^2$ ii) $BD^2 = 10^2+17^2-2(10)(17)\cos 85°$ $= 18.96\ \text{cm}$ iii) $84.68 = \frac{1}{2}\times 18.96\times (x)$ $x = 8.93\ \text{cm}$ b) $\frac{\sin \angle ABD}{15} = \frac{\sin 95°}{18.96}$ $\angle ABD = 52.01°$ $\angle ADB = 180° - 95° - 52.01°$ $= 32.99°$ $\frac{\sin 85°}{18.96} = \frac{\sin \angle BDC}{17}$ $\angle BDC = 63.28°$ $\therefore \angle ADC = 32.99° + 63.28°$ $= 96.27°$	1M 1M 1M 1M 1M 1M 1M 1M 1M 1M	10

13	$x + y \le 100$ (a) $y \ge 30$ $y \le 3x$ (b) Rujuk graf Draw one line correctly Draw all line correctly Shaded Region R (c) Guna: $5x + 8y$ Titik optimum = (10, 30) Keuntungan minimum 5(10) + 8 (30) Titik optimum = (25, 75) Keuntungan maksimum 5(25) + 8(75) Julat: RM 290 ≤ untung ≤ RM 725	1M 1M 1M 1M 1M 1M 1M 1M 1M 1M	10
14	(a) $v = 8 - 2t$ $a = \frac{dv}{dt} = -2$ (b) at Q, $v = 0$ $8 - 2t = 0$ $t = 4s$ (c) $s = \int v \ dt$ $s = \int (8 - 2t) \ dt$ When $t = 0, s = 0, c = 0$ $s = 8t - t^2$ When the particle is at $P, s = 48$ m $-48 = 8t - t^2$ $t^2 - 8t - 48 = 0$ $t = -4 \quad t = 12$	 1M 1M 1M 1M 1M	

	Velocity, $v = 8 - 2(12)$ $= -16\,\text{ms}^{-1}$ (d) When $t = 4$ $s = 8(4) - 4^2$ $= 16$ Total distance = 16 + 16 + 48 = 80 m	1M 1M 1M 1M 1M	10
15	a) $\frac{5.5}{c} \times 100 = 110$ $c = 5$ b) $\frac{b}{b-2} \times 100 = 140$ @ $\frac{a+2}{a} \times 100 = 140$ $b = 7$ @ $a = 5$ $a = 5$ @ $b = 7$ c) i) $\frac{4.55}{P_{2013}} \times 100 = 121$ $P_{2013} = \text{RM } 3.76$ ii) $2(114) + 5(125) + 2(140) + m(110)$ $\frac{2(114) + 5(125) + 2(140) + m(110)}{2 + 5 + 2 + m} = 121$ $m = 4$	1M 1M 1M 1M 1M 1M 1M 1M 1M 1M	10

GRAF SOALAN NO. 8

GRAF SOALAN NO. 13