

SULIT
3472/1
Additional
Mathematics
Paper 1

Mei
2007



PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA (PKPSM) CAWANGAN MELAKA

PEPERIKSAAN PERCUBAAN SPM
TAHUN 2007

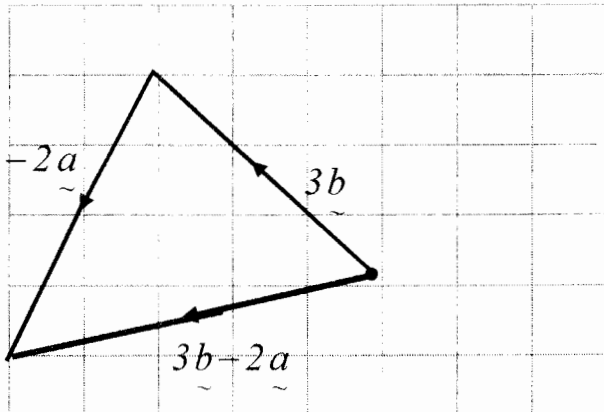
ADDITIONAL MATHEMATICS

Paper 1

MARKING SCHEME

This marking scheme consists of 5 printed pages

Number	Solution and marking scheme	Sub Marks	Full Marks
1	(a) {1,3,5,7} (b) 3,5	1 1	2
2	(a) 4 (b) -8 $\frac{6}{2-4} = 5-m$ or $\frac{4(5-m)}{5-m-2} = 2$	1 2 B1	3
3	$\beta = 2$ $k = -3$ $4(2)^2 = 7 - 3k$	1 2 B1	3
4	(a) 2 (b) $x = 2$ (c) (2, 1)	1 1 1	3
5	$a = 2, b = 8$ $(x-2)(x+4) > 0$ $x^2 + 2x - 8 > 0$	3 B2 B1	3
6	$x = -3$ $2^{x+3} = 2^0$ $2^x \cdot 2^4 - 2^x \cdot 2^3 = 2^0$	3 B2 B1	3
7	$x = 2$ $\log_x 2^3 = 3$ $\log_x (2^3)^{1/3} + \log_x (2^4)^{1/2} = 3$	3 B2 B1	3
8	$P = \frac{64}{\sqrt{q}}$ $\log_2 P \sqrt{q} = 6$	4 B3	4

Number	Solution and marking scheme	Sub Marks	Full Marks
	$\log_2 P + \frac{1}{2} \log_2 q = 6 \quad \text{@} \quad \log_2 P + \frac{\log_2 q}{2 \log_2 2} = 6$ $\log_2 P + \frac{\log_2 q}{\log_2 4} = 6$	B2 B1	
9	$d = \frac{6}{5}, \quad a = 6$ $a = 5d$ $a + 10d = 18 \quad \text{or} \quad a + 7d = 2(a + d)$	3 B2 B1	3
10	$r = 0.3$ $1 - r^3 = 0.973$ $\frac{a(1-r^3)}{(1-r)} = 0.973 \frac{a}{1-r}$	3 B2 B1	3
11	$y = \frac{x^2}{8}$ $\log_2 y = 2 \log_2 x - 3$ $\text{gradient} = 2 \text{ or } y \text{ intercept} = -3$	3 B2 B1	3
12	$p = 3, -4$ $(10p + 6 - p) - (2 - 5p + 6p) = \pm 28$ $\frac{1}{2} \begin{vmatrix} 2p & 2 & -p & 2p \\ 1 & 5 & 3 & 1 \end{vmatrix} = 14$	3 B2 B1	3
13		$\underline{-2a}$ 1 M arks $\underline{3b}$ 1 M arks $[\underline{3b - 2a} \text{ correct}]$ 1 M arks ----- 3 Marks	
14	a) $\begin{pmatrix} 15 \\ 5 \end{pmatrix}$ b) $ \overline{OC} = \sqrt{45} \text{ units}$	1 2	 3

Number	Solution and marking scheme	Sub Marks	Full Marks
	$\overline{OC} = \begin{pmatrix} 3 \\ 6 \end{pmatrix}$	B1	
15	a) $x = 6$ b) 3.6 $\frac{338}{5} - 8^2$	1 2 B1	3
16	$x = 19.47^{\circ}, 163.53^{\circ}, 210^{\circ}, 330^{\circ}$ $(2 \sin x + 1)(3 \sin x - 1) = 0$ $6 \sin^2 x + \sin x - 1 = 0$ $6 \sin^2 x = \sqrt{2} \left(\frac{1}{\sqrt{2}} \right) - \sin x$	4 B3 B2 B1	4
17	36.62 cm^2 $\frac{1}{2}(9)^2(0.9041)$ $\angle ZOY = 0.9041$	3 B2 B1	3
18	$\frac{dy}{dx} = \frac{-12}{(2x+1)^3}$ $\frac{dy}{dx} = -6(2x+1)^{-3}(2)$ or $\frac{-6}{(2x+1)^3}(2)$ $\frac{du}{dx} = 2$, or $\frac{dy}{du} = -6(u)^{-3}$ or $y = 3(2x+1)^{-2}$	3 B2 B1	3
19	(a) $k = 3$ $\frac{dy}{dx} = 2x - k$ (b) $\delta y = 0.15$ $\delta y = (2(3) - 3)(0.05)$	2 B1 2 B1	4

Number	Solution and marking scheme	Sub Marks	Full Marks
20	<p>-16</p> <p>$n = 6$ and $k = \frac{1}{18}$</p> <p>$n = 6$ or $k = \frac{1}{18}$</p> $\frac{(1+3x)^6}{18}$	<p>1</p> <p>3</p> <p>B2</p> <p>B1</p>	4
21	<p>a) 720</p> <p>b) 240</p> <p>$5 \times 2! \times 4!$</p>	<p>1</p> <p>2</p> <p>B1</p>	3
22	<p>a) 20349</p> <p>b) 7920</p> <p>c) 14976</p> ${}^9C_2 x^{12}C_3 + {}^9C_3 x^{12}C_2 + {}^9C_4 x^{12}C_1$	<p>1</p> <p>1</p> <p>2</p> <p>B1</p>	4
23	<p>(a) $\frac{4}{15}$</p> $\frac{8}{15} \times \frac{7}{14}$ <p>(b) $\frac{8}{15}$</p> $\left(\frac{8}{15} \times \frac{7}{14}\right) + \left(\frac{7}{15} \times \frac{8}{14}\right)$	<p>2</p> <p>B1</p> <p>2</p> <p>B1</p>	4
24	<p>$M = 600$ 1</p> <p>$100 = 600q$ 1</p> <p>$p = \frac{5}{6}$</p>	<p>3</p> <p>B2</p> <p>B1</p>	3
25	<p>$k = 0.85$</p> <p>$\mu = 60$</p> $0.85 = \frac{61.7 - \mu}{2}$	<p>1</p> <p>2</p> <p>B1</p>	3

END OF MARKING SCHEME

SULIT
3472/2
Additional
Mathematics
Paper 2
Sept
2007



PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH MALAYSIA (PKPSM) CAWANGAN MELAKA

PEPERIKSAAN PERCUBAAN SIJIL PELAJARAN MALAYSIA 2007

ADDITIONAL MATHEMATICS

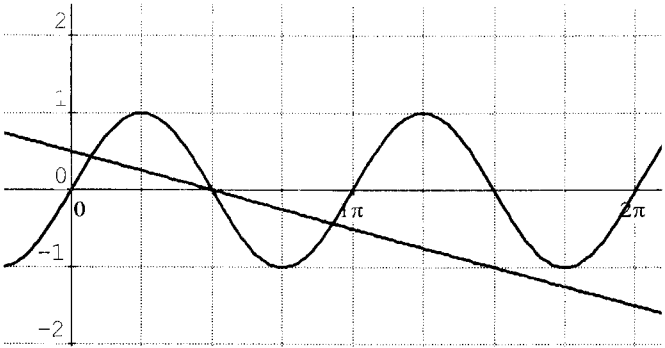
Paper 2

MARKING SCHEME

This marking scheme consists of 9 printed pages

SKEMA PERMARKAHAN MATEMATIK TAMBAHAN KERTAS 2
PEPERIKSAAN PERTENGAHAN TAHUN TINGKATAN 5, 2007

Number	Solution and marking scheme	Sub Marks	Full Marks
1	$y = 5 - 2x \quad \text{OR} \quad x = \frac{5-y}{2}$ $2x^2 + x(5-2x) - 2(5-2x)^2 - 37x + 98 = 0 \quad \text{or}$ $2\left(\frac{5-y}{2}\right)^2 + \left(\frac{5-y}{2}\right)y - 2y^2 - 37\left(\frac{5-y}{2}\right) + 98 = 0$ $x^2 - x - 6 = 0 \quad \text{or} \quad y + 8y - 9 = 0$ $(x-3)(x+2) = 0 \quad \text{or} \quad (y+9)(y-1) = 0$ $x = 3 \quad \text{or} \quad x = -2$ $y = -1 \quad \text{or} \quad y = 9$	P1 K1 K1 N1 N1	5
2(a)	(a) $ar^2 = 36 \quad \text{or} \quad a + ar + ar^2 = 76$ $\frac{a(1+r)}{ar^2} = \frac{40}{36}$ $a = 16$ (b) (i) $16 = a + 3d \quad \text{or} \quad 10 = a + 6d$ $d = -2, a = 22$ (ii) $0 = 22 + (n-1)(-2)$ $n-1 = 11 \quad \text{R} (11, 0)$	K1 K1 N1 3 K1 N1 K1 N1 4	7
3(a)	$y = x^2 - 6x + c$ $8 = (-2)^2 - 6(-2) + c$ $y = x^2 - 6x - 8$	K1(integrate) K1 N1 3	
(b)	$\frac{dy^2}{dx^2} = 2$ $(x^2 - 6x - 8)(2) + x(2x - 6) + 34 = 0$ $2x^2 - 9x + 9 = 0$ $(2x-3)(x-3) = 0$ $x = \frac{3}{2}, x = 3$	P1 K1 K1 N1(Both) 4	7
4(a)	RHS: $\sin 2x = 2 \sin x \cos x$ LHS: $\frac{2 \sin^2 x}{\tan x} = 2 \frac{\sin^2 x}{\frac{\sin x}{\cos x}}$ $= 2 \sin x \left(\frac{\sin x}{\tan x} \right)$ $= 2 \sin x \cos x$	K1 use $\tan x = \frac{\sin x}{\cos x}$ N1	

Number	Solution and marking scheme	Sub Marks	Full Marks
4(b)		P1(sin 2x curve) P1(max =1;min= -1) P1(2 Period for $0 \leq x \leq 2\pi$) N1($y = \frac{1}{2} - \frac{x}{\pi}$) K1(line graph y-intercept 0.5) N1(3 no of solution)	8
5 (a) (b)	a) 41- 45 b) Mid-point 48 & 28 Range = 48 - 28 = 20 Or L = 35.5 Or F= 12 Or $fm = 10$ Median = $35.5 + \left[\frac{\frac{1}{2}(40) - 12}{10} \right] 5$ = 39.5	P1 K1 N1 P1 K1 N1	6
6	a) (i) $-4a + 4b$ (ii) $4a + \frac{1}{4}(-4a + 12b)$ = $3a + 3b$ b) (i) $-4ha + 4hb$ (ii) $3ka + 3kb$ c) $-4h + 3k = -1$ or $4h + 3k = 3$ $k = \frac{1}{3}$ and $h = \frac{1}{2}$	P1 K1 N1 P1 P1 K1 N1	7
7	Refer to the graph		10
8(a)	(a) $\frac{dy}{dx} = -\frac{48}{(3x+1)^3}$ = $-\frac{48}{(3(-1)+1)^2}$ or 6	K1 K1 K1	

Number	Solution and marking scheme	Sub Marks	Full Marks
	<p>Pers. normal : $y - 2 = -\frac{1}{6}(x + 1)$ $x + 6y - 11 = 0$</p> <p>(b) (i) Luas = $\int_{-3}^{-2} \frac{8}{(3x+1)^2} dx$ $= \left \frac{8(3x+1)^{-1}}{-1(3)} \right _{-3}^{-2}$ $= \frac{-8}{3(3(-2)+1)} + \frac{8}{3(3(-3)+1)}$ $= \frac{1}{5}$</p> <p>(ii) Isipadu = $\pi \int_{-3}^{-2} \frac{64}{(3x+1)^4} dx$ $= \pi \left \frac{64(3x+1)^{-3}}{-3(3)} \right _{-3}^{-2}$ $\pi \left(\frac{64}{-9(-5)^3} - \frac{64}{-9(-8)^3} \right)$ $= \frac{43}{1000} \pi$</p>	<p>N1 4</p> <p>K1(Integration)</p> <p>K1(limit)</p> <p>J1</p> <p>K1 (Integration)</p> <p>K1 (Limit)</p> <p>J1</p>	10
9(a)	<p>a) $x = \frac{-2(1)+1(5)}{3}$ or $y = \frac{2(4)+1(7)}{5}$ T(1, 5)</p> <p>(ii) $m_{TC} = -2$ Garis TC : $y = -2x + 7$ $3x - 8 = -2x + 7$ N(3, 1)</p> <p>(iii) Luas = $\frac{1}{2} \begin{vmatrix} -1 & 3 & 5 & -1 \\ 4 & 1 & 7 & 4 \end{vmatrix}$ = 15</p> <p>b) $PA = 2 PB$ $(x+1)^2 + (y-4)^2 = 4[(x-5)^2 + (y-7)^2]$ $x^2 + y^2 - 14x - 16y + 93 = 0$</p>	<p>K1</p> <p>N1 2</p> <p>P1</p> <p>K1</p> <p>N1</p> <p>K1(using formula)</p> <p>N1</p> <p>P1</p> <p>K1</p> <p>N1</p>	10

Number	Solution and marking scheme	Sub Marks	Full Marks
10(a)	<p>a) State equilateral triangle WAB</p> <p>b) area of sector $ABWX = 18.85 \text{ cm}^2$ area of triangle $ABW = 15.59 \text{ cm}^2$ area of segment $WXA = 18.85 - 15.59$ $= 3.26 \text{ cm}^2$</p> <p>c) area of semicircle $YABW = 18\pi \text{ cm}^2$ area of triangle $ABW +$ segment $AWX +$ segment $WBC = 15.59 + 3.26 + 3.26$ $= 22.11 \text{ cm}^2$</p> <p>Area of shaded region $= 18\pi - 22.11$ $= 34.44 \text{ cm}^2$</p>	<p>P1</p> <p>K1 K1 K1 N1</p> <p>K1 K1 N1</p> <p>K1 N1</p>	10
11(a)	<p>(a) $P(X = 5) = {}^8C_5(0.7)^5(0.3)^3$ $= 0.2541$</p> <p>$P(X \geq 1) > 0.99$</p> <p>${}^nC_0(0.7)^0(0.3)^n < 0.01$ $n > 3.82$ $n = 4$</p> <p>(b) (i) $P\left(\frac{157-165}{8} < Z < \frac{177-165}{8}\right)$ $1 - P(Z > 1.5) - P(Z > 1)$ $1 - 0.0668 - 0.1587$ 0.7745</p> <p>(ii) 0.7745×2000 1549</p>	<p>K1 N1</p> <p>K1</p> <p>K1 N1</p> <p>K1</p> <p>K1 N1</p> <p>K1 N1</p>	10
12(a)	<p>$x = \frac{RM1.20}{RM0.80} \times 100$</p> <p>$= 150$</p> <p>$\frac{y}{RM3.60} \times 100 = 120$</p> <p>$y = RM 4.32$</p>	<p>K1(guna $I = \frac{P_1}{P_0} \times 100$ pd. $x @ y @ z$)</p> <p>N1</p> <p>N1</p>	

Number	Solution and marking scheme	Sub Marks	Full Marks	
(b)	$\frac{RM4.60}{z} \times 100 = 115$ $z = RM 4.00$ $\bar{I} = \frac{120(110) + 60(150) + 50(120) + 130(115)}{360}$ $= 119.86$	N1 K1(guna $\bar{I} = \frac{\sum I_i w_i}{\sum w_i}$ dan $w = 50$) N1	10	
(c)	$\frac{P_1}{RM30} \times 100 = 119.86$ $P_1 = RM 35.96$	K1 N1		
(d)	$\bar{I} = \frac{115}{100} \times 119.86$ $= 137.84$	K1 N1		
13	(a) $KM^2 = 16^2 + 13^2 - 2(16)(13) \cos 60^\circ$ $KM = 14.73 \text{ cm}$ (b) $\frac{\sin \angle Q}{14.73} = \frac{\sin 50^\circ}{11.63}$ $\angle Q = 76.07^\circ, 103.93^\circ @ 76^\circ 4', 103^\circ 56'$ (c) (i) $\angle MKQ = 26.07^\circ$ $\frac{MQ}{\sin 26.07^\circ} = \frac{11.63}{\sin 50^\circ}$ $MQ = 6.672 \text{ cm}$ (ii) Luas = Luas KLM + Luas KMQ $= 127.70 \text{ cm}^2$	K1 N1 K1 N1 K1 K1 N1 K1K1 N1		
14	a) $a = 15 - 6t$ $15 - 6t = 0, \quad t = \frac{15}{6} \text{ s}$ $V_{\max} = 18 \frac{3}{4} \text{ ms}^{-1} // 18.75 // \frac{75}{4}$	K1 K1 N1 K1		

Number	Solution and marking scheme	Sub Marks	Full Marks
	<p>b) $S = \frac{15}{2}t^2 - t^3$ Distance travelled = $S_4 - S_3$ $= 56 - 40\frac{1}{2}$ $= 15\frac{1}{2}\text{m}$</p> <p>c) $\frac{15}{2}t^2 - t^3 = 0,$ $t = \frac{15}{2}\text{s}$</p> <p>d) $15t - 3t^2 = 0$ Time between = 5 s</p>	<p>K1 K1 N1 K1 N1 K1 N1</p>	10
	<p>(a) $x + y \leq 100$ $y \geq 2x$ $y - x \geq 30$</p> <p>(b) Graph : K1 - Uniform scale and involving x , y is drawn correctly . N1 - All lines drawn correctly N1 - Correct region .</p> <p>(c) (i) $y_{\min} = 50$ $y_{\max} = 80$ (ii) $k = 40x + 20y$ $= 40(20) + 20(80)$ $= 2400$</p>	<p>P1 P1 P1 P1 P1 K1 N1</p>	10

x	1.0	1.5	2.0	2.5	3.0	3.5	T1
$\text{Log}_{10}y$	0.7482	0.6712	0.5933	0.5105	0.4376	0.3617	

