

3472/2

Matematik
Tambahan
Kertas 2
Ogos 2014

2 ½ jam



KEMENTERIAN
PENDIDIKAN
MALAYSIA

**BAHAGIAN PENGURUSAN
SEKOLAH BERASRAMA PENUH DAN SEKOLAH KECEMERLANGAN
KEMENTERIAN PELAJARAN MALAYSIA**

**PENTAKSIRAN DIAGNOSTIK AKADEMIK SBP 2014
PERCUBAAN SIJIL PELAJARAN MALAYSIA**

ADDITIONAL MATHEMATICS

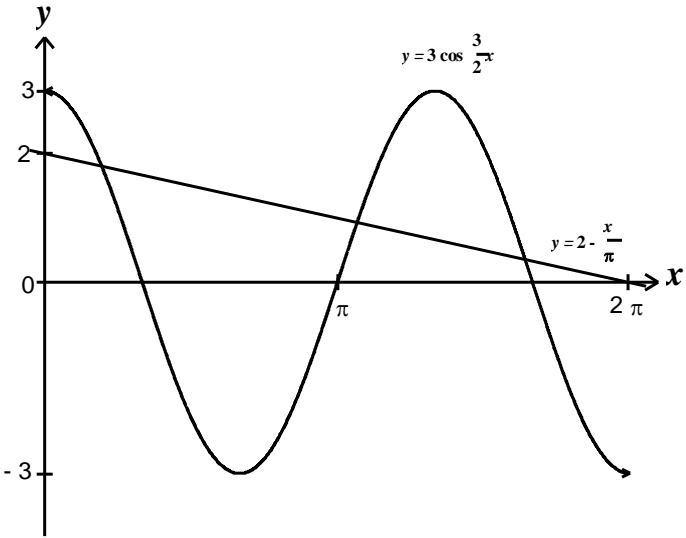
Paper 2

MARKING SCHEME

Skema Pemarkahan ini mengandungi **10** halaman bercetak

No	Solution and Mark Scheme	Sub Marks	Total Marks
1	$x = \frac{6-2y}{3} \qquad y = \frac{6-3x}{2}$ $5y - 4\left(\frac{6-2y}{3}\right)5\left(\frac{6-2y}{3}\right)y \qquad \text{OR} \qquad 5\left(\frac{6-3x}{2}\right) - 4x = 5x\left(\frac{6-3x}{2}\right)$ $10y^2 - 7y - 24 = 0 \qquad 15x^2 - 53x + 30 = 0$ $y = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(10)(-24)}}{2(10)} \qquad x = \frac{-(-53) \pm \sqrt{(-53)^2 - 4(15)(30)}}{2(15)}$ $y = 1.94, -1.24 \qquad x = 0.71, 2.83 \qquad \text{N1}$ $x = 0.71, 2.83 \qquad y = 1.94, -1.24 // -1.25 \qquad \text{N1}$	<p>P1</p> <p>K1</p> <p>K1</p>	5
2(a)	$h(x) = -2(x-1)^2 + 2 - m \qquad \text{K1}$ $2 - m = 7 - 6k \qquad \text{K1}$ $m = 6k - 5 \qquad \text{N1}$	3	8
(b)	$k = \frac{1}{2} \quad m = -2 \qquad \text{N1, N1}$	2	
(c)	$-2x^2 + (4-n)x - 8 = 0 \qquad \text{K1}$ $(4-n)^2 - 4(-2)(-8) = 0 \qquad \text{K1}$ $n = -4, 12 \qquad \text{N1}$	3	

3(a)	$2\pi r, 2\pi(r+1), 2\pi(r+2), \dots$ K1 $\frac{7}{2}[2(2\pi r) + 6(2\pi)] = 216\pi$ K1 $r = 15$ length of ribbon = 30π N1	3	6
(b)	$30\pi, 32\pi, 34\pi, \dots$ K1 $d = 2\pi$ K1 $48\pi = 30\pi + (n-1)(2\pi)$ $n = 9$ N1	3	
4 (a)	$m = -1$ K1 $y = -x + 8$ N1	2	7
(b)	$\frac{4(5) + x(2)}{7} = 6$ or $\frac{4(5) + y(2)}{7} = 2$ K1 $P(11, -3)$ N1	2	
(c)	$AB = \sqrt{8}$ K1 $\sqrt{(x-4)^2 + (y-4)^2} = \sqrt{8}$ K1 $x^2 + y^2 - 8x - 8y + 24 = 0$ N1	3	

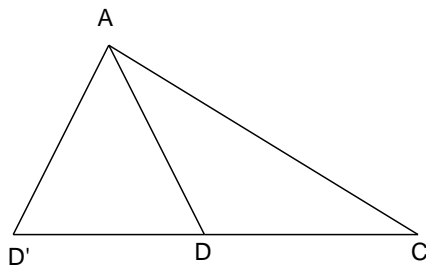
5(a)	 <p>Shape of Cosine $0 \leq x \leq 2\pi$ P1</p> <p>Period 1.5 cycle P1</p> <p>Amplitude 3 P1</p> <p>$y = 2 - \frac{x}{\pi}$ K1</p> <p>Draw line $y = 2 - \frac{x}{\pi}$ K1</p> <p>Number of solutions = 3 N1</p>	3	6
6(a)	<p>Mean = $\frac{15.5 \times 2 + 25.5 \times 5 + 35.5 \times 12 + 45.5 \times 6 + 55.5 \times 7}{32}$ K1</p> <p>= 38.94 N1</p>	2	8
(b)	<p>Varian = $\frac{15.5^2 \times 2 + 25.5^2 \times 5 + 35.5^2 \times 12 + 45.5^2 \times 6 + 55.5^2 \times 7}{32} - (38.94)^2$ K1K1</p> <p>= 134.86 N1</p>	3	

(c)	$Q_3 = 40.5 + \left(\frac{\frac{3}{4}(32) - 19}{6} \right) \times 10$ $= 41.33$	K1K1 N1	3	
7	LAMPIRAN			
8 (a)	$\frac{dy}{dx} = 4x$ $m_N = -\frac{1}{4}$ $y - 5 = -\frac{1}{4}(x - 1)$ $y = -\frac{1}{4}x + \frac{21}{4}$	K1 K1 N1	3 4	10
(b)	$\text{Area} = \frac{1}{2}(4+5)(1) - \int_0^1 2x^2 + 3 dx$ $= \frac{9}{2} - \left[\frac{2x^3}{3} + 3x \right]_0^1$ $= \frac{9}{2} - \left[\left(\frac{2}{3} + 3 \right) - 0 \right]$ $\frac{5}{6}$	K1 K1 K1 N1		
(c)	$\text{Volume} = \pi \int_3^5 \left(\frac{y-3}{2} \right) dy$ $= \pi \left[\frac{y^2}{4} + \frac{3y}{2} \right]_3^5$ $= \pi \left[\left(\frac{5^2}{4} + \frac{3(5)}{2} \right) - \left(\frac{3^2}{4} + \frac{3(3)}{2} \right) \right]$ 7π	K1 K1 N1	3	

9(a)	$\overrightarrow{BQ} = \overrightarrow{BA} + \overrightarrow{AQ} \quad \text{Or} \quad \overrightarrow{AC} = \overrightarrow{AD} + \overrightarrow{DC} \quad \text{K1}$ <p>(i) $\overrightarrow{BQ} = -3\hat{x} + 6\hat{y} \quad \text{N1}$</p> <p>(ii) $\overrightarrow{AC} = 5\hat{y} + \frac{3}{2}\hat{x} \quad \text{N1}$</p> <p>(b) $\overrightarrow{AP} = 5m\hat{y} + \frac{3}{2}m\hat{x} \quad \text{K1}$</p> <p>$\overrightarrow{AP} = (3-3n)\hat{x} + 6n\hat{y} \quad \text{K1}$</p> <p>Compare and solve</p> <p>$\frac{3}{2}m = 3-3n \quad \text{and} \quad 5m = 6n \quad \text{K1}$</p> <p>$m = \frac{3}{4} \quad \text{N1}$</p> <p>$n = \frac{5}{8} \quad \text{N1}$</p> <p>(c) $\overrightarrow{PD} = \frac{3}{8}\overrightarrow{BQ} + \overrightarrow{QD} \quad \text{or} \quad \overrightarrow{PD} = \frac{1}{4}\overrightarrow{AC} + \frac{1}{2}\overrightarrow{BQ} \quad \text{K1}$</p> <p>$\overrightarrow{PD} = -\frac{9}{8}\hat{x} + \frac{17}{4}\hat{y} \quad \text{N1}$</p>	3	10
10(a)	<p>(i) $\mu = 10(0.75)$ $= 7.5 \quad \text{N1}$</p> <p>$\sigma^2 = 10(0.75)(0.25)$ $= 1.875 \quad \text{N1}$</p> <p>(ii) $P(X \geq 9) = P(X = 9) + P(X = 10)$ $= {}^{10}C_9(0.75)^9(0.25)^1 + {}^{10}C_{10}(0.75)^{10}(0.25)^0 \quad \text{K1 K1}$ $= 0.2440 \quad \text{N1}$</p>	2	10

(b)(i)	$P(1.3 < x < 2.5) = P\left(\frac{1.3-1.5}{0.8} < z < \frac{2.5-1.5}{0.8}\right)$ $= P(-0.25 < z < 1.25)$ $= 0.4931$	K1 K1 N1	3	
(ii)	$\text{Total} = \frac{160}{0.4931}$ 324	K1 N1	2	
11(a)	$\angle AOB = \sin^{-1}\left(\frac{5}{8}\right)$ $\angle AOB = 0.6752 \text{ rad}$	K1 N1	2	10
(b)	$FC = \left(\sqrt{8^2 - 5^2}\right) - 4$	K1		
	$\cap CD = 4(1.571)$	K1	4	
	$\text{Perimeter} = \left(\left(\sqrt{8^2 - 5^2}\right) - 4\right) + (4(1.571)) + 5 + 4 + 8$ $= 25.53 \text{ cm}$	K1 N1		
(c)	$\Delta BFO = \frac{1}{2}(5)(6.245)$	K1	4	
	$\frac{1}{2}(4^4)(0.6752) \text{ Or } \frac{1}{2}(4^4)(1.571 - 0.6752)$	K1		
	$\text{Area} = \frac{1}{2}(5)(6.245) - \frac{1}{2}(4^2)(0.6752) + \frac{1}{2}(4^2)(1.571 - 0.6752)$ $= 17.38 \text{ cm}^2$	K1 N1		

12(a)	$5 - 2t = 0 \quad \text{K1}$ $t = \frac{5}{2}$ $v = 5t - t^2 + 14 \quad \text{K1}$ $v_{\max} = 5\left(\frac{5}{2}\right) - \left(\frac{5}{2}\right)^2 + 14$ $= 20.25 \quad \text{N1}$	3	10
(b)	$5t - t^2 + 14 = 0 \quad \text{K1}$ $t^2 - 5t - 14 = 0$ $(t + 2)(t - 7) = 0 \quad \text{K1}$ $t = 7 \quad \text{N1}$	3	
(c)	$s = \frac{5t^2}{2} - \frac{t^3}{3} + 14t \quad \text{K1}$ $s_7 = \frac{5(7)^2}{2} - \frac{(7)^3}{3} + 14(7) \quad \text{or} \quad s_9 = \frac{5(9)^2}{2} - \frac{(9)^3}{3} + 14(9) \quad \text{K1}$ $\text{Total distance} = 106\frac{1}{6} + 106\frac{1}{6} - 85\frac{1}{2} \quad \text{K1}$ $= 127\frac{1}{3} \quad \text{N1}$	4	

13(a)	$EC^2 = 6.5^2 + 3.5^2 - 2(6.5)(3.5)\cos 70^\circ$ K1 6.24 cm N1	2	10
(b)	$\frac{\sin \angle BAC}{3.5} = \frac{\sin 70}{6.24}$ K1 Use $\angle ACD = \angle BAC = 31.81^\circ$ K1 $\angle ADC = 180^\circ - 62.74^\circ$ K1 117.26° N1	4	
(c)(i)	 $\angle AD'C$ must acute angle N1	1	
(ii)	$\angle D'AD = 180^\circ - 2(62.74^\circ)$ K1 $\Delta ADD' = \frac{1}{2}(3.7)(3.7)(\sin 54.52^\circ)$ K1 5.57 cm^2 N1	3	
14	LAMPIRAN		

15(a)	$\frac{12}{Q_{10}} \times 100 = 125$ $Q_{10} = \text{RM } 9.60$	<p>K1</p> <p>N1</p>	2	10
(b)	<p>Use 120</p> $\frac{120}{100} \times 110$ $= 132$	<p>P1</p> <p>K1</p> <p>N1</p>	3	
(c)	$\frac{Q_{12}}{90} \times 100 = 121$ $Q_{12} = \text{RM}108.90$	<p>K1</p> <p>N1</p>	2	
(d)	$\frac{110(8) + 136(5) + 120m + 125(4)}{8 + 5 + m + 4} = 121$ $\frac{2060 + 120m}{17 + m} = 121$ $m = 3$	<p>K1</p> <p>K1</p> <p>N1</p>	3	

END OF MARKING SCHEME