Additional
Mathematics
Paper 1

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PROGRAM PENINGKATAN PRESTASI AKADEMIK
SPM 2014

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ADDITIONAL MATHEMATICS

MARKING SCHEME

Paper 1

MODUL 1

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Marking Scheme Module 1
Additional Mathematics Paper 1

Question	Solution/ Marking Scheme	Answer	Marks
1		(*a*) 5 (*b*) {5, 7, 9} (*c*) {1, 3, 5, 7, 9}	1 1 1
2	(*a*) B1: $3a + 2 = x$ (*b*) B1: $f^{-1}(5)$	(*a*) $\frac{x-2}{3}$ (*b*) 1	2 2
3	(*b*) B2: $6(\frac{x-7}{3})+5$ B1 : $g^{-1}(x)=\frac{x-7}{3}$	(*a*) -7 (*b*) $2x-9$	1 3
4	B2 : $x=3\cdot137$ *or* $x=-0\cdot637$ B1 : $2x^2-5x-4=0$	$x=3\cdot137$ *and* $x=-0\cdot637$	3
5	B2 : $3\alpha+3\beta=-4$ *and* $(3\alpha)(3\beta)=-18$ B1 : $\alpha+\beta=-\frac{4}{3}$ *and* $\alpha\beta=-2$	$x^2+4x-18=0$	3
6	B1 : $m = 4$ **or** $t = 3$	$m = 4$ **and** $t = 3$	2

Question	Solution/ Marking Scheme	Answer	Marks
7	B2 : $x=2$ *and* $x=-\frac{4}{3}$ @ $-1\cdot33$ B1 : $f(x)=3x^2-2x-8<0$	$-\frac{4}{3}<x<2$	3
8	B2: $5^m = 5^3$ or $5^{1+m} = 5^4$ B1 : $3(5^m)(5)$ or 5^{1+m} or 5^4 or $5^m(15-10)=625$	3	3
9	B2 : $\frac{y}{4-y}=3$ **or** $y=3(4-y)$ B1 : $\log_3\frac{y}{4-y}$ or $\log_3 3$ or 3^1	$y=3$	3
10	B2 : $2\log_2 x=\log_2 4^2$ or $x^2 = 4^2$ B1 : $\log_2 x=\frac{\log_2 4^2}{\log_2 x}$	$x=4$	3
11	(*b*) B1 : $T_2=5(2)-2(2)^2-3$ $[d=S_2-S_1-S_1]$	(*a*) 3 (*b*) -4	1 2
12	B1: $\frac{6}{q}=\frac{4q}{6}$	$q=3,-3$	2

Question	Solution/ Marking Scheme	Answer	Marks
13	(*b*) B1 : $S_n = \dfrac{2(1)}{1-\left(-\frac{2}{3}\right)}$	(*a*) $-\frac{2}{3}$ (*b*) $\frac{6}{5}$	1 2
14	(*b*) B1 : $\log_{10} k = -1$	(*a*) $\log_{10} k = (-\log_{10} 3)x + \log_{10} k$ (*b*) $\frac{1}{10}$@0.1	1 2
15	B3: $22 + 4m = 42$ **or** $22 + 4m = -42$ B2 : $\frac{1}{2}\left\|(2+3+5m)-(-15+m-2)\right\| = 21$ B1 : $(2+3+5m)$ or $(-15+m-2)$	$m = 5$ **and** $m = -16$	4
16	B2 : $x^2+6x+9+y^2-8y+16=4\left(x^2-12x+36+y^2+4y+4\right)$ B1 : $\sqrt{(x+3)^2+(y-4)^2} = 2\sqrt{(x-6)^2+(y+2)^2}$	$x^2+y^2-18x+8y+45=0$	3
17	B3: $2.5(2)+2.5+2.5$ B2 : $\theta = 2$ B1 : $\frac{1}{2}(2.5)^2\theta = 6.25$	10	4

Question	Solution/ Marking Scheme	Answer	Marks
18	(*b*) B2 : $\left\|\overrightarrow{AC}\right\| = \sqrt{3^2+4^2} = 5$ B1 : $\overrightarrow{AC} = \frac{1}{3}\begin{pmatrix}9\\12\end{pmatrix} = \begin{pmatrix}3\\4\end{pmatrix}$	(*a*) $\overrightarrow{AB} = \begin{pmatrix}9\\12\end{pmatrix}$ @ $9\underset{\sim}{i}+12\underset{\sim}{j}$ (*b*) $\frac{1}{5}\begin{pmatrix}3\\4\end{pmatrix}$ @ $\frac{1}{5}\left(3\underset{\sim}{i}+4\underset{\sim}{j}\right)$	1 3
19	(*a*) B1: $\overrightarrow{OB} = \overrightarrow{OA} + \overrightarrow{AB}$	(*a*) $\overrightarrow{OB} = \begin{pmatrix}11\\7\end{pmatrix}$ (*b*) $B(11, 7)$	2 1
20	B2 : $4q = \frac{70}{10} - (\sqrt{p})^2$ B1 : $\frac{70}{10} - (\sqrt{p})^2$	$p = 7 - 4q$	3
21	B2: $y - 1 = \frac{2}{3}(x-3)$ B1: $m_{\text{perpendicular}} = \frac{2}{3}$	$y = \frac{2}{3}x - 1$	3
22	(*b*) B1 : $\cot A = \frac{1}{\frac{15}{8}}$ or $\tan A = \frac{15}{8}$	(*a*) $-\frac{15}{17}$ (*b*) $\frac{8}{15}$	1 2

Question	Solution/ Marking Scheme	Answer	Marks
23	(*a*) B1 : $\frac{dy}{dx} = \left(\frac{x}{2} - 7 \right)$ (*b*) B1 : $\delta x = p$ **or** $\delta y = -5(p)$	(*a*) -5 (*b*) $-5p$	2 2
24	B2 : $3 \cdot 2\pi = 8\pi(5) \bullet \frac{dr}{dt}$ B1 : $\frac{dA}{dr} = 8\pi r$	$0 \cdot 08 \text{cms}^{-1}$	3
25	(*b*) B2 : $8 + m[4-2] = 12$ B1 : $\int_0^2 f(x)dx + \int_2^4 f(x)dx = 8$	(*a*) -4 (*b*) $m = 2$	1 3

END OF MARKING SCHEME