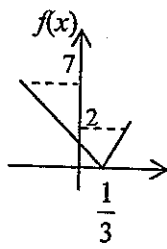


Program Peningkatan Prestasi Sains & Matematik 2009
Additional Mathematics Marking Scheme – Paper 1

1	<p>(a) graph as shown</p>  <p>'V' shaped graph</p> <p>(b) $0 \leq f(x) \leq 7$</p>	2	6	<p>(a) $h = -5$</p> <p>(b) $k = 25$</p> <p>(c) $x = -5$</p>	1 1 1
2	<p>(a) $f(x) = \frac{x+2}{3}$</p> <p>(b) $k = \frac{5}{2}$ $4k - 3 = 7$ $f^{-1}(2) = 4$</p>	1	7	<p>$x = 16$</p> <p>$\log_2 x = 4$</p> <p>$3^{\log_2 x} = 3^4$</p>	3 B2 B1
3	<p>(a) $m = \frac{1}{2}$</p> <p>(b) $p = -3$</p> <p>$\frac{4-p}{7} = 1$</p>	1	8	<p>$y = \frac{9}{x^6}$</p> <p>$\log_3 x^6 y = \log_3 9$</p> <p>$\log_3 xy + \log_3 x^5 = \log_3 9$</p>	3 B2 B1
4	<p>$h = \frac{4}{3}$</p> <p>$(-4)^2 - 4(h)(3) = 0$</p>	2	9	<p>$x = 4$</p> <p>$\frac{8}{x} = \frac{3}{x}$</p>	2 B1
5	<p>$-1 < p < 3$</p> <p>$(p-3)(p+1) < 0$</p> <p>$(-2p)^2 - 4(2p+3) < 0$</p>	3	10	<p>$a = 7, d = 5$</p> <p>$a = 7 \text{ or } d = 5$</p> <p>$a + d = 12 \text{ and } a + 9d = 52$</p>	3 B2 B1

11	$r=2$ $\frac{1}{2} r^9 = 256 \text{ or } r^9 = 512$	2 B1	15	$C(16, 2)$ $\overrightarrow{OQ} = \begin{pmatrix} 7 \\ -1 \end{pmatrix} + \begin{pmatrix} 9 \\ 3 \end{pmatrix}$	2 B1
12	$y = \frac{1}{x^3} + \frac{3}{x}$ $xy = \frac{1}{x^2} + 3$ $c = 3$ $m = 1$	4 B3 B2 B1	16	(a) $\overrightarrow{RP} = \overrightarrow{RQ} + \overrightarrow{QP}$ $= -2y - 3x$ $\overrightarrow{RQ} = -2y \text{ or } \overrightarrow{QP} = -3x$ (b) $\overrightarrow{PS} = x + 2y$ $\overrightarrow{SR} = 2x \text{ or } \overrightarrow{RS} = -2x$	2 B1 2 B1
13	(a) $y = 2x - 6$ (b) $y = -\frac{1}{2}x + \frac{3}{2}$ $y - 0 = -\frac{1}{2}(x - 3) \text{ or } c = \frac{3}{2}$ $m = -\frac{1}{2}$	1 3 B2 B1	17	(a) $\frac{1}{\sqrt{t}}$ (b) $\sqrt{\frac{t}{1+t}}$ $\sin(180^\circ - \theta) = \sin \theta$	1 2 B1
14	$h = \frac{3}{2}$ $\frac{2+4}{2h+1-1} = 2 \text{ or } \frac{6}{2h} = 2$ $m = 2$	3 B2 B1	18	(a) $11.31 / \sqrt{128}$ (b) 18.23 $\frac{1}{2}(11.31)^2 \left(\frac{\pi}{4}\right) - \frac{1}{2}(8)(8)$ $\frac{1}{2}(11.31)^2 \left(\frac{\pi}{4}\right)$	1 3 B2 B1

19	$\frac{dx}{dt} = -\frac{4}{3}$ $\frac{dx}{dt} = -\frac{1}{3} \times 4$ $\frac{dy}{dx} = -3$	3 B2 B1	23	(a) 840 ${}^6C_2 \times {}^8C_3$ (b) 48 ${}^2P_1 \times 4! / 4 \times 3 \times 2 \times 1 \times 2$	2 B1 2 B1
20	(a) $p = \frac{5}{2}$ (b) $y = \frac{5}{4}x^2 + 3x + 2$ $c = 2$ $y = \frac{5}{4}x^2 + 3x + c$	1 3 B2 B1	24	(a) 0.7215 $1 - {}^{10}C_0 (0.12)^0 (0.88)^{10}$ (b) 334 0.2785×1200	2 B1 2 B1
21	3 $\frac{1}{4-k} - \frac{1}{5} = \frac{4}{5}$ $\left[\frac{(4-x)^{-1}}{-1(-1)} \right]_{-1}^k$	3 B2 B1	25	(a) $k = 1.13$ $P(z > k) = 0.1292$ (b) $X = 81.61$ $-1.13 = \frac{X - 85}{3}$	2 B1 2 B1
22	(a) $m = 30$ (b) 10848 $4 = \frac{\sum x^2}{12} - 30^2$	1 2 B1			