4

MODUL
PERKEMBANGAN PEMBELAJARAN
SPM 2019

Skema
MPP 3

MATEMATIK TAMBAHAN

MARK SCHEME FOR ADDITIONAL MATHS. – MPP3 2019

PAPER 1

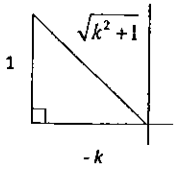
No	Mark Scheme		Σ Marks
1	*(a)* $S = \{1, 2, 3, 4\}$	1	2
	(b) 4	1	
2	*(a)* 0.85	1	3
	(b) 0.275	2	
	$0.15 + k + k + 0.3 = 1$ or $k + k + 0.3 = 0.85$	B1	
3	$m = \frac{5}{3}$, $n = 1$ (both)	2	2
	$m = \frac{5}{3}$ or $n = 1$	B1	
4	(a) $x = -a \pm \sqrt{3a^2 + 5a - 2}$	2	4
	$x = \frac{-(2a) \pm \sqrt{(2a)^2 - 4(1)(-2a^2 - 5a + 2)}}{2(1)}$ or setara	B1	
	(b) $a \leq -2$ dan $a \geq \frac{1}{3}$	2	
	$12a^2 + 20a - 8 \geq 0$	B1	

5	(a) $f^{-1}(x)=\frac{4x+3}{2}$	1	3
	(b) $f^{-1}g(x)=\frac{8x+31}{2}$	2	
	$\frac{4(2x+7)+3}{2}$	B1	
6	(a) $P(h)=8+5h$	1	3
	(b) RM18, wang mencukupi	2	
	$P(2)=8+5(2)$	B1	
7	$p=1$, $q=6$ (both)	3	3
	$p=1$ or $q=6$	B2	
	$\frac{p}{5}=\frac{1}{5}$ or $-\frac{-q}{5}=\frac{6}{5}$	B1	
8	4	3	3
	$x-4(x-1)=-2x$	B2	
	$2^{3x}=2^{4(x-1)}$ or $\frac{2^x}{2^{4(x-1)}}=\frac{1}{2^{2x}}$	B1	

9	$6q-8p+2$	4	4
	$\frac{3\log_a 7+\log_a a-4\log_a 2}{\frac{1}{2}}$ or $6\log_a 7+2\log_a a-\log_a 2$	B3	
	$\frac{\log_a 343+\log_a a-\log_a 16}{\frac{1}{2}}$ or guna 2 hukum	B2	
	$\frac{\log_a \frac{343a}{16}}{\log_a \sqrt{a}}$ tukar asas or $\log_{\sqrt{a}} 343+\log_{\sqrt{a}} a-\log_{\sqrt{a}} 16$	B1	
10	(a) $m=10, n=-4$ (both)	2	3
	$\frac{1}{2}\log_{10} m=0.5$ or $\frac{n}{2}=-2$	B1	
	(b) $\log_{10} y=\frac{1}{2}-2\log_{10} x$	1	
11	(a) (0, 7)	1	3
	(b) $\left(\frac{1}{2},10\right)$	2	
	$\frac{1(-1)+2(x)}{3}=0$ or $\frac{1(1)+2(y)}{3}=7$	B1	
12	(a) $h=2$, $k=-8$ (both)	2	4
	$\frac{7+h}{2}=\frac{6+3}{2}$ or $\frac{-1-2}{2}=\frac{5+k}{2}$	B1	
	(b) 34	2	
	$\frac{1}{2}\lvert(35-6-16-6)-(-3+10-12-56)\rvert$	B1	

13	(a) Min	1	3
	(b) Median	1	
	(c) Mod	1	
14	(a) $\theta = 2$ rad	2	4
	$j\theta = 2j$	B1	
	(b) 32	2	
	perimeter $= j(2) + 8 - j + 8(2) + 8 - j$	B1	
15	$11y + x = 134$ or equivalent	3	3
	$y - 12 = \frac{-1}{11}(x-2)$ OR $c = \frac{134}{11}$	B2	
	$m = \frac{-1}{11}$	B1	
16	Panjang = 12, lebar = 4	4	4
	$\frac{64x}{8\pi} - \frac{6x^2}{8\pi} = 0$	B3	
	$V = \frac{x^2}{4\pi}\left(\frac{32-2x}{2}\right)$	B2	
	$2x + 2y = 32$ or $y = \frac{32-2x}{2}$	B1	
17	janjang aritmetik, $d = \log_2 x^2$ (both)	2	2
	(accept $d = 2\log_2 x$)		
	$\log_2\left(\frac{x^5}{x^3}\right)$ or $\log_2\left(\frac{x^3}{x}\right)$ OR $3\log_2 x - \log_2 x$ or $5\log_2 x - 3\log_2 x$	B1	

18	(a) $n = 51$, $p = 1$ (both)	2	4
	$T_{Julia} = 1.5 + (n-1)(-0.03) = 0$ or $T_{Norma} = P + (51-1)(-0.02) = 0$	B1	
	(b) 12.75 m	2	
	$S_{51 Julia} = 38.5$m or $S_{51 Norma} = 25.5$m or $S_{51} = 1.5 + 50(-0.03)$	B1	
19	$k = \frac{27}{4m^3}$	3	3
	$\frac{mk}{3} = \frac{9}{4m^2}$	B2	
	$\frac{9}{4m^2}$ or $\frac{mk}{3}$	B1	
20	(a) $h = 6$	2	4
	$4 - 2\left(\frac{3}{2}\right) = h\left(\frac{3}{2}\right) - 8$	B1	
	(b) $y = 3x^2 - 8x + 9$	2	
	$\int hx - 8\,dx$ or find the value of c	B1	
21	(a) $n = \frac{1}{2}$, $m = \frac{3}{2}$ (both)	2	4
	$2n - 1 = 0$ or $m + n - 2 = 0$	B1	
	(b) $m = 4$	2	
	$m - 4 = 0$	B1	

22	a) $-\frac{1}{k}$  Dilihat k pada rajah **or** $\tan y = \frac{1}{k}$	2 B1	4
	b) $\frac{k^2-1}{k^2+1}$ $1-2\left[\frac{1}{\sqrt{k^2+1}}\right]^2$	2 B1	
23	(a) $k = h+g$ (b) $n=5$	1 1	2
24	(a) 6 (b) 12 ${}^2P_2 \times {}^3P_3$ or $2!\times 3!$	1 2 B1	3
25	48.46 $\frac{b-50}{1.04} = -1.484$ $P\left(X < \frac{b-50}{1.04}\right) = 0.0688$	3 B2 B1	3

BIL	Peraturan Pemarkahan (BAHAGIAN A)		Jumlah
1	$x = \frac{1+3y}{2}$	P1	5
	$\frac{3}{\left(\frac{1+3y}{2}\right)} + \frac{2}{y} = 1$ atau $3y + 2\left(\frac{1+3y}{2}\right) = \left(\frac{1+3y}{2}\right)y$	K1	
	$6y+2+6y = y+3y^2$ $3y^2 - 11y - 2 = 0$		
	$\frac{-(-11) \pm \sqrt{(-11)^2 - 4(3)(-2)}}{2(3)}$	K1	
	$y = 3.840$; $y = -0.1736$	N1	
	$x = 6.261$; $x = 0.2396$	N1	
2	(a) $120°$	P1	7
	$\frac{2}{3}\pi$ rad (atau 2.095 radian)	N1	
	(b) luas sector ACD $= \frac{1}{2}r^2\left(\frac{4}{3}\pi\right)$	K1	
	Luas ΔBAC $= \frac{1}{2}r^2 \sin\frac{1}{3}\pi$ atau $\frac{1}{2}r^2 \sin 60°$	K1	
	Luas tembereng AC atau Luas tembereng AD $= \frac{1}{2}r^2\left(\frac{1}{3}\pi\right) - \frac{1}{2}r^2 \sin 60°$	K1	
	Luas kawasan berlorek $= \frac{1}{2}r^2\left(\frac{4}{3}\pi\right) - 2\left[\frac{1}{2}r^2\left(\frac{1}{3}\pi\right) - \frac{1}{2}r^2 \sin 60°\right]$	K1	
	$= \frac{1}{6}r^2\left(2\pi + 3\sqrt{3}\right)$	N1	