



**MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN**

SPM 2019

**MATEMATIK TAMBAHAN
KERTAS 1**

UNTUK KEGUNAAN PEMERIKSA SAHAJA

**SKEMA
PEMARKAHAN**

No.	Solution and Mark Scheme	Sub Marks	Total Marks
1 (a)	0.1131	1	3
(b)	$X = 28.63$ B1 : $1.21 = \frac{X-25}{3}$	2	
2	$q = \sqrt{p}$ or equivalent B1 : $\frac{4 \log_p q}{\log_p p} = \frac{\log_p p}{\frac{1}{2}}$	2	2
3 (a)	$-\frac{1}{4}$	1	3
(b)	$0 \leq f(x) \leq 15$ B1 : $f(-4) = 4(-4)+1 $	2	
4	$p = -2$ and $q = 6$ B2: $p = -2$ or $q = 6$ B1: $\frac{y}{x^2} = px + q$	3	3
5	$r = -3, s = -\frac{5}{2}$ (Both) B2 : $r^2 = 9$ or $-rs - s = -5$ B1 : $r(rx - s) - s = 9x - 5$	3	3
6	-3 B1: $\frac{dy}{dx} = 3x^2 - 3$	2	2
7	$q = 6$ B2: $q > \frac{16}{3}$ B1: $(-8)^2 - 4(q)(3) < 0$	3	3
8 (a)	$3n+1$	1	3
(b)	$m = -\frac{1}{2}$ B1 : $x = -1$ (seen)	2	
9 (a)	6	1	3
(b)	$1 \leq q \leq 11$ or equivalent	2	

	B1 : $5+q=16$ or $10+q=11$		
10 (a)	$y=9x^2$	1	
(b)	$x=3$ B2 : $x^2=2x+3$ or equivalent B1 : $\frac{\log_9 x}{\log_9 3}$ or $\frac{\log_3(2x+3)}{\log_3 9}$	3	4
11	$x = \frac{\log 8}{\log h}$ * any base B2 : $h^x = 8$ B1 : $(h^x)^2$	3	3
12 (a)	$(v-w-1)x + wy$ or equivalent	1	
(b)	$v = \frac{3}{2}$ B1 : $v-w-1=0$ or equivalent	2	3
13	16, -8 (both) B2 : $\sqrt{(4-h)^2 - (5)^2} = 13$ B1 : $2(2i-3j) - (hi-j)$	3	3
14	$p=16, p=-16$ (both) B2 : $p = \frac{8}{3}a$ and $a = \pm 6$ B1 : $-\left(\frac{-p}{2}\right) = a + \frac{1}{3}a$ or $12 = (a)\left(\frac{1}{3}a\right)$	3	3
15	$2x^2 + 4x + 1 = 0$ B2 : $\alpha + \beta = -2$ and $\alpha\beta = \frac{1}{2}$ B1 : $2\alpha + 2\beta = -\frac{8}{2}$ or $2\alpha(2\beta) = \frac{4}{2}$	3	3
16	$V(0, -\frac{8}{t^2})$ B2 : $\frac{-y}{-8} = -\frac{1}{t}$ or $-\frac{8}{x} = t$ or equivalent B1 : $m_{UV} = -\frac{1}{t}$	3	3

17 (a)	$q < 0$	1	4
(b)	$\frac{2}{\sqrt{4-q^2}}$	1	
(c)	$\frac{p^2-2}{p^2}$ or $1-\frac{2}{p^2}$ or equivalent B1 : $2\left(\frac{\sqrt{p^2-1}}{p}\right)^2 - 1$ or equivalent	2	
18	97.13° , 135° (both) B2 : 45° , 82.87° (basic angle) B1 : $\tan^2 x + 7 \tan x - 8 = 0$	3	3
19 (a)	$\frac{\pi}{3}$	1	4
(b)	$\frac{25\pi}{4} - \frac{25m}{2}$ B2 : $\frac{1}{2}(5)^2\left(\frac{\pi}{2}\right) - \frac{1}{2}(5)^2(m)$ B1 : $\frac{1}{2}(5)^2\left(\frac{\pi}{2}\right)$ or $\frac{1}{2}(5)^2(m)$	3	
20	(a)(i) $2h+8$ (ii) -4 (b) $\frac{5k^2}{2} - 4k + \frac{3}{2}$ or equivalent B1 : $\frac{1}{10}(5t-4)^2$	1 1 2	

21	$x + 2y = 5$ or equivalent B3: $y - 2 = -\frac{1}{2}(x - 1)$ B2: (1,2) seen B1: $\frac{dy}{dx} = 2x$ or kec. normal = $-\frac{1}{2}$	4	4
22	0.34 B2: $(0.4)(0.7) + (0.6)(0.1)$ B1: $(0.4)(0.7)$ or $(0.6)(0.1)$	3	3
23	55 B3 : $n = 11$ B2 : $2 = 32 + (n - 1)(-3)$ B1 : $a = 32$ or $d = -3$ (dilihat / seen)	4	4
24	2880 B2 : $2 \times 3! \times 2 \times 5!$ or equivalent B1 : $3!$ or $5!$	3	3
25 (a)	$C(-30, 0)$	1	
(b)	6.6 minutes , not qualified (Both) B2 : 0.11 hour B1 : $\sqrt{(60 - 30)^2 + (40 - 0)^2}$ or $\sqrt{(40 - 0)^2 + (0 - (-30))^2}$	3	4