



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

**PERCUBAAN SPM
2021**

**MATEMATIK TAMBAHAN
KERTAS 1**

UNTUK KEGUNAAN PEMERIKSA SAHAJA

**SKEMA
PEMARKAHAN**


PERATURAN PEMARKAHAN PERCUBAAN SPM 2021
MATEMATIK TAMBAHAN (3472/1)
KERTAS 1

No. Item	Peraturan Pemarkahan		Sub-Markah	Markah Penuh	
1	a	6P_4 atau $6 \times 5 \times 4 \times 3$ 360	K1 N1	2 2	4
	b	${}^5P_3 \times 2({}^1P_1)$ atau $2 \times {}^5P_3$ atau $2 \times 5 \times 4 \times 3$ 120	K1 N1		
2	a	$g^{-1}(x) = \frac{2\left(\frac{-2x-6}{x-3}\right) - 1}{\left(\frac{-2x-6}{x-3}\right)}$ $g^{-1}(x) = \frac{5x+9}{2x+6}, x \neq 3$ $g(x) = \frac{-6x+9}{2x-5}, x \neq \frac{5}{2}$	K1 K1 N1	3 2	5
	b	$g(p) = 12$ $\frac{-6(p)+9}{2(p)-5} = 12$ $p = \frac{23}{10}$	K1 N1		

3	a	<p>i. $QR = -8p + 12q$</p> <p>ii. $PT = 2p + 9q$</p>	N1	2	6
	b.	<p>$PS = 2hp + 9hq$ dan $RS = 2kp - 7kq$</p> <p>$PR = PS + SR$</p> <p>$12q = (2h - 2k)p + (9h + 7k)q$</p> <p>$12 = 9h + 7k$, $0 = 2h - 2k$</p> <p>$h = \frac{3}{4}, k = \frac{3}{4}$</p>	K1		
4	a	<p>$\frac{36}{5} \sec^2 \theta - 24 \tan \theta = 0$</p> <p>$\frac{36}{5} (\tan^2 \theta + 1) = 24 \tan \theta$</p> <p>$3 \tan^2 \theta - 10 \tan \theta + 3 = 0$</p> <p>$(3 \tan \theta - 1)(\tan \theta - 3) = 0$</p> <p>$\tan \theta = \frac{1}{3}, \tan \theta = 3$</p>	K1	3	5
	b	<p>$\sin(-45) = -\frac{\sqrt{2}}{2}$</p> <p>$\operatorname{kosek}(-45) = \frac{1}{\sin(-45)}$</p> <p>$\operatorname{kosek}(-45) = \frac{1}{-\frac{\sqrt{2}}{2}}$</p> <p>$-\sqrt{2}$</p>	K1		
			N1		

5	a	$y = x^2 + p$, A(2,q) $q = (2)^2 + p$ Pintasan-y = q - 4	K1 N1	2	5
	b	q = 5 , A(2, 5) $y = x^2 + 1$ $\frac{dy}{dx} = 2x$, $m = 4$ $y - 5 = 4(x - 2)$ $y = 4x - 3$	K1 K1 N1	3	
6	a	$T_1 = h + 2$, $T_3 = 2h - 11$, $T_5 = \frac{h + 2}{9}$ $h + 2 + 2d = 2h - 11$, $h + 2 + 4d = \frac{h + 2}{9}$ $d = \frac{h - 13}{2}$ $h + 2 + 4\left(\frac{h - 13}{2}\right) = \frac{h + 2}{9}$ $h = \frac{109}{13}$	K1 K1 N1	3	5
	b	$d = \frac{h - 13}{2}$ $\frac{\left(\frac{109}{13}\right) - 13}{2}$ $-\frac{30}{13}$	K1 N1	2	

7	a	$\log_{p+1}4 = 2$ atau $\log_{p+1}8 = 3$ atau $\log_{p+1}32 = q$ $4 = (p + 1)^2$ $p + 1 = 2$ $p = 1$ $2^q = 32$ $q = 5$	K1 N1 N1	3	5
	b	$\log_2 y = m \log_2 x + c$ $m = 1, c = 1$ $\log_2 y = \log_2 x + 1$ $y = 2^{\log_2 x + 1}$	K1 N1	2	
8	a	1.696	N1	1	5
	b	$OM^2 = 6^2 - 4.5^2$ $OM = 3.969$ $DC = 6 - 3.969$ $= 2.031$ $A1 = \frac{1}{2}(6 + 2.031)(4.5)$ or $A2 = \frac{1}{2}(6)^2(0.848)$ $A1 - A2$ 2.806	K1 K1 N1	4	
9		$\frac{11}{4 + \sqrt{5}} \times \frac{4 - \sqrt{5}}{4 - \sqrt{5}}$ $(\sqrt{m + n\sqrt{5}})^2 = (4 - \sqrt{5})^2$ $21 - 8\sqrt{5}$ $m = 21, n = -8$ $m - n = 29$	K1 K1 N1 N1	5	5

10	a	$P(X=r) = {}^6C_r \left(\frac{1}{5}\right)^r \left(\frac{4}{5}\right)^{6-r}$ $P(X \geq 3) = P(X=3) + P(X=4) + P(X=5) + P(X=6)$ Atau $P(X \geq 3) = 1 - P(X=0) - P(X=1) - P(X=2)$ 0.09888 ii) $\sqrt{705 \times 0.2 \times 0.8} = 10.621$	K1 K1 N1 N1	4	7
	b	a) $P(X > 9) = 0.2743$ dan $Z = 0.6$ b) $\frac{9 - \mu}{5} = 0.6$ $\mu = 6$	P1 K1 N1	3	
11	a	$x^2 - 8x + 15 \geq 0$  atau kaedah yang sah $x \leq 3 \text{ dan } x \geq 5$	K1 N1	2	6
	b	$\alpha + \beta = \frac{7}{2} \text{ atau } \alpha\beta = \frac{1}{2}$ $\alpha^2 + \beta^2 = (\alpha + \beta)^2 - 2\alpha\beta$ $\alpha^2 + \beta^2 = \left(\frac{7}{2}\right)^2 - 2\left(\frac{1}{2}\right) = \frac{45}{4}$ $HTP = \frac{7}{2} + \frac{45}{4} = \frac{59}{4} \text{ atau } HDP = \frac{7}{2} \times \frac{45}{4} = \frac{315}{8}$ $8x^2 - 118x + 315 = 0$ $p = -118 \text{ dan } q = 315$	P1 K1 K1 N1	4	

	b	<p>i) Kecerunan $AC = \frac{3}{2}$</p> <p>Kecerunan $BC = -\frac{2}{3}$</p> <p>Persamaan BC, $y - 5 = -\frac{2}{3}(x - 3)$</p> $y = -\frac{2}{3}x + 7 \dots\dots\dots \text{eq2}$ $\frac{1}{5}x + \frac{9}{5} = -\frac{2}{3}x + 7$ $x = 6, y = 3$ <p>Koordinat $B(6,3)$</p> <p>Koordinat $D(x,y)$</p> $\frac{6+x}{2} = 1, x = -4$ $\frac{3+y}{2} = 2, y = 1$ <p>Koordinat $D(-4,1)$</p> <p>ii) Luas $ABCD = \frac{1}{2} \begin{vmatrix} -1 & 6 & 3 & -4 & -1 \\ -1 & 3 & 5 & 1 & -1 \end{vmatrix}$</p> $= \frac{1}{2} (-3 + 30 + 3 + 4) - (-6 + 9 - 20 - 1) $ $= 26$	K1 N1 K1 N1 K1 N1	6	
14	a	$\log_2 \left(\frac{y^2}{y+5} \right) = 4$ $y^2 - 16y - 80 = 0$ $y = 20$	K1 K1 N1	3	8
	b	<p>a) i) $\log_a \left(\frac{24}{\frac{3}{8} \times 3^6} \right)$</p> $\log_a \left(\frac{64}{81 \times 9} \right)^{\frac{1}{2}}$ $N = \frac{8}{27}$	K1 K1 N1	5	

		$\text{ii) } \log_{\frac{2}{3}} \left(\frac{2}{3} \right)^3$ 3	K1 N1		
15	a	$A1 = 2x \times x^2 = 2x^3 \text{ atau}$ $A2 = \int_{-x}^x x^2 dx = \left[\frac{x^3}{3} \right]_{-x}^x = \frac{2}{3} x^3$ $A1 - A2 = 2x^3 - \frac{2}{3} x^3$ $\frac{4}{3} x^3 = \frac{16}{3}$ $x = \sqrt[3]{4} = 1.587$ $k = x^2 = (\sqrt[3]{4})^2 = \sqrt[3]{16} = 2.520$	K1 K1 N1	3	8
	b	<p>i) $m_{\text{tangen}} = 6$</p> $p(1) + 2 = 6$ $p = 4$ <p>ii) $y = \int 4x + 2 dx$</p> $y = 2x^2 + 2x + c$ <p>Gantikan (1,-8) ke dalam $y = 2x^2 + 2x + c$</p> $-8 = 2(1)^2 + 2(1) + c$ $c = -12$ $y = 2x^2 + 2x - 12$ $y = 2(x+3)(x-2)$	K1 N1 K1 N1	5	

PERATURAN PEMARKAHAN TAMAT