

**PERATURAN  
PEMARKAHAN  
MATEMATIK TAMBAHAN  
TINGKATAN 5**

**KERTAS 1  
3472/1 (PP)**

**MODUL PENINGKATAN PRESTASI MURID  
TINGKATAN 5 2022**

**MPSM NEGERI KEDAH**

	Skema Permarkahan	Sub Markah	Jumlah Markah
1(a)	<p><math>f(x)</math> ialah suatu fungsi kerana garis mencancang memotong graf hanya pada satu titik P1</p> <p>or</p> <p><math>g(x)</math> bukan suatu fungsi kerana garis mencancang memotong graf lebih dari satu titik</p>	1	4
1(b)	<p><math>3m^2 + 2 = 3[(m+3)^2] + 3</math> K1 K1</p> <p><math>m = -\frac{14}{9}</math> N1</p>	3	
2	<p><math>m = \frac{4+(-1)}{2}</math> K1</p> <p><math>= \frac{3}{2}</math> N1</p> <p>P1 - Bentuk</p> <p>P1 - Pintasan-x dan titik minimum</p>	4	4

	Skema Permarkahan	Sub Markah	Jumlah Markah
3	$\frac{x}{2} + \frac{y}{3} = 1 \dots\dots\dots(1)$ $x^2 - y + y^2 = 12 \dots\dots\dots(2)$ <p>Dari (1) : <math>x = \frac{6-2y}{3} \dots\dots\dots(3)</math> K1</p> <p>Ganti (3) dalam(2)</p> $\left(\frac{6-2y}{3}\right)^2 - y + y^2 = 12 \quad \text{K1}$ $13y^2 - 33y - 72 = 0$ $y = \frac{-(-33) \pm \sqrt{(-33)^2 - 4(13)(-72)}}{2(13)} \quad \text{K1}$ <p>KONONO jika tiada kaedah /pembentukan</p> $y = 3.94, y = -1.40 \quad \text{N1}$ $x = -0.627, x = 2.93 \quad \text{N1}$	5	5
4 (a)	$3^{-n} (15^n - 27^n)$ $= 3^{-n} (3^n 5^n - 3^n 9^n) \quad \text{K1}$ $= 3^{-n} \cdot 3^n (5^n - 9^n)$ $= 5^n - 9^n \quad \text{N1}$	2	
(b)	$\sqrt{4x} - \sqrt{x} = \frac{3}{\sqrt{a} - \sqrt{b}}$ $2\sqrt{x} - \sqrt{x} = \frac{3}{\sqrt{a} - \sqrt{b}} \times \frac{\sqrt{a} + \sqrt{b}}{\sqrt{a} + \sqrt{b}} \quad \text{K1}$ $\sqrt{x} = \frac{3(\sqrt{a} + \sqrt{b})}{a - b}$ $x = \frac{9(\sqrt{a} + \sqrt{b})^2}{(a - b)^2}$ $h = \frac{9}{(a - b)^2} \quad \text{N1}$	2	7

(c)	$5e^{n-3} = e^{-2}$ $\frac{e^{n-3}}{e^{-2}} = \frac{1}{5}$ $e^{n-1} = \frac{1}{5} \quad \text{P1}$ $\ln e^{n-1} = \ln\left(\frac{1}{5}\right) \quad \text{K1}$ $n-1 = \ln\left(\frac{1}{5}\right)$ $n = \ln\left(\frac{1}{5}\right) + 1$ $m = \frac{1}{5} \quad \text{N1}$	3	
5(a)	<p>Pak Abu, <math>A_n</math>: 100, 104, 108, ...</p> <p>Pak Kasim, <math>K_n</math>: 400, 402, 404, ...</p> $A_n = 100 + (n-1)(4) \quad \text{K1 (atau)}$ $K_n = 400 + (n-1)(2)$ $100 + (n-1)(4) > 400 + (n-1)(2) \quad \text{K1}$ $2n > 302$ $n > 151$ $n = 152 \quad \text{N1}$	3	
5(b)	<p>Jarak ayunan lengkap: 400, 340, 289, ...</p> $S_n < 2434$ $\frac{400[1-0.85^n]}{1-0.85} < 2434 \quad \text{K1 P1} \quad \begin{array}{l} r=0.85 \\ a=400 \end{array}$ <p style="text-align: right;">ditunjukkan dalam formula</p> $0.85^n > 0.08725$ $\lg 0.85^n > \lg 0.08725$ $n \lg 0.85 > \lg 0.08725$ $n < \frac{\lg 0.08725}{\lg 0.85}$ $n < 15.007$ $n = 15 \quad \text{N1}$ <p><math>\therefore</math> Bilangan ayunan lengkap ialah 15 ayunan.</p>	3	6

	Skema Permarkahan	Sub Markah	Jumlah Markah
6	$\frac{y}{x^3} = m - \frac{n}{x}$ <p style="text-align: right;">K1 (salah satu)</p> $\frac{y}{x^2} = mx - n$ $h = m - 3 \quad \text{K1}$ $n = 6h \quad \text{K1}$ $n = 6m - 18 \quad \text{N1}$	4	4
7(a)	Koordinat P (-4, 0) dan koordinat Q (0, -8) $PB : PQ = 2 : 5$ $PB : BQ = 2 : 3$ Jawapan (a) Koordinat B = $\left( \frac{3(-4) + 2(0)}{2+3}, \frac{3(0) + 2(-8)}{2+3} \right)$ $= \left( -\frac{12}{5}, -\frac{16}{5} \right)$	3	6
7(b)	$\text{Luas } \triangle OPB = \frac{1}{2} \begin{vmatrix} 0 & -4 & -\frac{12}{5} & 0 \\ 0 & 0 & -\frac{16}{5} & 0 \end{vmatrix}$ $= \frac{32}{5} \text{ unit}^2$ <p style="text-align: right;">K1 salah satu luas segitiga</p> $\text{Luas } \triangle OQB = \frac{1}{2} \begin{vmatrix} 0 & -\frac{12}{5} & 0 & 0 \\ 0 & -\frac{16}{5} & -8 & 0 \end{vmatrix}$ $= \frac{48}{5} \text{ unit}^2$ $\text{Nisbah luas } \triangle OPB : \triangle OQB = \frac{32}{5} : \frac{48}{5}$ $= 2 : 3$ <p style="text-align: right;">K1 atau setara N1</p>	3	

	Skema Permarkahan	Sub Markah	Jumlah Markah
8(a)	$ y  = \sqrt{4^2 + (-2)^2} = 2\sqrt{5}$ N1 $\overline{ON} = \begin{pmatrix} 5 \\ 12 \end{pmatrix} + 4 \begin{pmatrix} 4 \\ -2 \end{pmatrix}$ K1 $\overline{ON} = \begin{pmatrix} 21 \\ 4 \end{pmatrix}$ N1	3	6
(b)	$\overline{ON} = \begin{pmatrix} 5+4t \\ 12-2t \end{pmatrix}$ K1 $y=0$ $12-2t=0$ K1 $t=6$ N1	3	

	Skema Permarkahan	Sub Markah	Jumlah Markah
9(a)	$\angle BAH = 45^\circ \times \frac{\pi}{180}$ $= \frac{1}{4} \pi \text{ radian} \quad \text{N1}$	1	4
(b)	<p>Luas Kolam Kanak-kanak or Luas Kolam Dewasa = 2 kali Kolam kanak2</p> $= \frac{1}{2} \times (r+2r) \times r \quad \text{or} \quad = 2 \times \frac{3r^2}{2} \quad \text{K1}$ $= \frac{3r^2}{2} \text{ meter}^2 \quad = 3r^2 \text{ meter}^2$ <p>Luas Sektor = <math>3r^2</math></p> $\frac{1}{2} r^2 \theta = 3r^2$ $= 6 \text{ rad} \quad \text{K1}$ <p>Perimeter Kolam dewasa = <math>16r \text{ meter}^2</math> N1</p>	3	
10(a)	$\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3} = \lim_{x \rightarrow 3} \frac{(x-3)(x+3)}{x-3} \quad \text{K1}$ $= \lim_{x \rightarrow 3} (x+3)$ $= 3+3$ $= 6 \quad \text{N1}$	2	6
(b)	$\frac{dA}{dr} = \frac{8}{9} r \quad \text{K1}$ $\delta A = \frac{dA}{dr} \times \delta r$ $= 200p \quad \text{K1}$ $\% \delta A = \frac{\delta A}{A} \times 100\%$ $= \frac{200p}{22500} \times 100\% \quad \text{K1}$ $= \frac{8}{9} p\% \quad \text{N1}$	4	

	Skema Permarkahan	Sub Markah	Jumlah Markah
11	<p>Biar <math>x</math> = ketinggian menara</p> $\tan 3\theta = \frac{x}{\alpha}; \tan 2\theta = \frac{x}{4+\alpha}; \tan \theta = \frac{x}{16+\alpha}$ <p><math>x = \alpha \tan 3\theta</math></p> $x = \alpha \tan(2\theta + \theta)$ $x = \alpha \left[ \frac{\tan 2\theta + \tan \theta}{1 - \tan 2\theta \tan \theta} \right]$ $x = \alpha \left[ \frac{\frac{x}{4+\alpha} + \frac{x}{16+\alpha}}{1 - \left(\frac{x}{4+\alpha}\right)\left(\frac{x}{16+\alpha}\right)} \right]$ $x = \sqrt{64 - \alpha^2}$	<p>P1</p> <p>P1</p> <p>K1</p> <p>K1</p> <p>N1</p>	5
12(a)	<p>(i) <math>3! = 6</math></p> <p>(ii) <math>2! = 2</math> [498 dan 894]</p>	<p>N1</p> <p>N1</p>	2
(b)	<p><math>{}^9C_5 \times 5!</math> atau <math>{}^9P_5</math></p> <p><math>= 15120</math> <math>= 15120</math></p>	<p>K1</p> <p>N1</p>	2
(c)	<p>(i) <math>{}^9C_8 \times (8-1)! = 45360</math></p> <p>(ii) Bilangan cara <math>= {}^6C_1 \times 2! \times 5!</math></p> <p><math>= 1440</math></p>	<p>N1</p> <p>K1</p> <p>N1</p>	3
13	<p>a) <math>40 \left(\frac{3}{4}\right)</math></p> <p><math>= 30</math></p> <p>b) <math>1 - \left[ {}^5C_0 (0.25)^0 (0.75)^5 + {}^5C_1 (0.25)^1 (0.75)^4 \right]</math></p> <p>0.3672</p>	<p>K1</p> <p>N1</p> <p>K1 guna rumus</p> <p>K1 guna pelengkap atau setara</p> <p>N1</p>	5
13(c)	<p><math>P(X \geq 1) = P(X=1) + P(X=2) + \dots + P(X=10)</math></p> <p><math>1 - P(X=0)</math></p> <p><math>1 - {}^{10}C_0 \left(\frac{1}{4}\right)^0 \left(\frac{3}{4}\right)^{10}</math></p> <p>0.9437</p>	<p>K1</p> <p>N1</p>	3
			8



	Skema Permarkahan	Sub Markah	Jumlah Markah
14(a)	$\frac{dy}{dx} = \frac{(2x-3)(1)-(x)(2)}{(2x-3)^2}$ $\frac{x}{2x-3} + c$	K1 N1	2
14(b)	$\frac{2x^2}{2} - 4x + c$ <p>Persamaan lengkung dasar kolam</p> $y = x^2 - 4x$ <p>Jarak tegak Ahmad ke dasar kolam</p> <p>=1.75 m</p>	K1 N1 N1	3
14(c)	$= \pi \left[ \frac{y^2}{2} + 4y \right]_{-2}^2$ $= \pi \left[ \left( \frac{2^2}{2} + 4(2) \right) - \left( \frac{(-2)^2}{2} + 4(-2) \right) \right]$ $= 16\pi \text{ m}^3$	K1 K1 N1	3
15(a)	<p>(i) <math>k = 32</math></p> <p>(ii) <math>\frac{1}{8}(t-16)^2 = 0</math></p> <p><math>t = 16 \text{ s}</math></p> <p>(iii) <math>H(21) = \frac{1}{8}(21-16)^2</math></p> <p><math>H(21) = 3.125</math></p> <p>Ketinggian burung helang = 3.125 m</p>	N1 K1 N1 K1 N1	5
15(b)	<p>Titik minimum = (6,-0.9)</p> $\frac{1}{10}[t^2 - 12t + 27] < 0$ $(t-3)(t-9) < 0$ <p>Julat masa: <math>3 &lt; t &lt; 9</math></p>	N1 K1 N1	3

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PERATURAN PEMARKAHAN TAMAT