



i-MODUL KECEMERLANGAN SPM SMKA DAN SABK 2023

SIJIL PELAJARAN MALAYSIA 2023 (SET 1)

MATEMATIK TAMBAHAN

Kertas 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

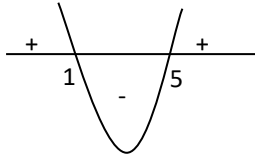
AMARAN

Peraturan pemarkahan ini **SULIT** dan **Hak Cipta Majlis Pengetua SMKA** dan **Majlis Pengetua SABK**. Kegunaan khusus untuk guru-guru tingkatan 5 di SMKA dan SABK sahaja. Peraturan ini tidak boleh dikeluarkan dalam apa jua bentuk media cetak.

Peraturan pemarkahan ini mengandungi 7 halaman bercetak

CADANGAN PERATURAN PEMARKAHAN (SKEMA)

Kertas 1

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh |
|--------------|--|----------------------------|--------------|
| 1 | $x^2 + 3x = px - 1$ $(3 - p)^2 - 4(1)(1) \geq 0$ $(p - 1)(p - 5) \geq 0$ dan  $p \leq 1, \quad p \geq 5$ | K1 K1 K1 N1 | 4 |
| 2 | $3(2+3x)^2(3)$ $\frac{(1+x)(9)(2+3x)^2 - (2+3x)^3(1)}{(1+x)^2}$ $\frac{(2+3x)^2(7+6x)}{(1+x)^2}$ | K1 K1 N1 | 3 |
| 3 | $\frac{40-\mu}{\sigma} = -0.674 \quad \text{atau} \quad \frac{75-\mu}{\sigma} = 1.281 \parallel 1.282$ $\frac{40-\mu}{\sigma} = -0.674 \quad \text{dan} \quad \frac{75-\mu}{\sigma} = 1.281 \parallel 1.282$ <p>Selesaikan persamaan serentak</p> $\mu = 52.06$ $\sigma = 17.89$ | K1 K1 K1 N1 N1 | 5 |
| 4 (a) | $\ln y = 2 \ln x - 2$ $y = \frac{x^2}{e^2}$ | K1 N1 | 5 |
| (b) | $4 = 2p - 2 \quad \text{atau} \quad q = 2(10) - 2$ $p = 3$ $q = 18$ | K1 N1 N1 | |

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh |
|--------------|---|------------------------------------|--------------|
| 5 (a) | $\frac{9p^{\frac{3}{2}}q}{27p^{\frac{1}{2}}q} = \frac{3p^{\frac{5}{2}}q}{9p^{\frac{3}{2}}q} = \frac{1}{3}p$ <p>Janjang Geometri dengan nisbah sepunya $r = \frac{1}{3}p$.</p> | P1 NI | 7 |
| | (b) $\frac{320}{2} [2(2) + (320-1)(2)]$ <p>102720</p> $\frac{12}{2} [2(2000) + (12-1)(900)]$ <p>83400</p> <p>Syarikat A. Kerana jumlah gaji lebih tinggi.</p> | K1 N1 K1 N1 N1 | |
| 6 (a) | $\delta x = \frac{b-a}{n} \text{ dan } L_{\text{segi empat}} = y_i \delta x$ $L_{\text{jumlah}} = \sum_{i=1}^n y_i \delta x$ <p>Apabila $n \rightarrow \infty, \delta x \rightarrow 0$,</p> $L_{\text{jumlah}} = \lim_{\delta x \rightarrow 0} \sum_{i=1}^n y_i \delta x$ $L_{\text{jumlah}} = \int_a^b y \, dx$ | K1 K1 N1 | 5 |
| | (b) $L = \int_1^4 3x^{-2} \, dx$ $L = \left[-\frac{3}{x} \right]_1^4$ $L = \left[-\frac{3}{4} \right] - \left[-\frac{3}{1} \right]$ $L = 2\frac{1}{4}$ | K1 N1 | |

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh |
|--------------|--|--------------------------|--------------|
| 7 (a) | $5^{x-1} = 5^{2\left(\frac{7-y}{2}\right)}$ $y = 8 - x$ $\left(\frac{h}{k}\right)^7 \text{ atau } \left(\frac{k}{h}\right)^{-x-2y}$ $y = \frac{7-x}{2}$ | K1 N1 K1 N1 | |
| (b) | $\frac{3+x\sqrt{2}}{4-\sqrt{2}} \times \frac{4+\sqrt{2}}{4+\sqrt{2}}$ $\frac{12+3\sqrt{2}+4x\sqrt{2}+2x}{4^2-(\sqrt{2})^2}$ $m = \frac{6+x}{7}, n = \frac{3+4x}{14}$ | P1 K1 N1 | 7 |
| 8(a) | $h = 3$ $yx - 2x = 3y + 5$ $f^{-1}(x) = \frac{3x+5}{x-2}, x \neq 2$ $k = 2$ | N1 K1 N1 N1 | |
| (b) | (13,4) | N1 | 5 |
| 9 (a) | Ganti rumus $\cos(\theta + \theta) = \cos\theta\cos\theta - \sin\theta\sin\theta$ dan $\cos^2\theta = 1 - \sin^2\theta$ $1 - 2\sin^2\theta$ | K1 N1 | |
| (b) | $-3(1 - 2\sin^2\theta) = 5 - 8\sin\theta$ $(3\sin\theta - 2)(\sin\theta + 2) = 0 \text{ dan}$ sudut rujukan, $\alpha = 41^\circ 49' \parallel 41.81$ $\theta = 41^\circ 49', 138^\circ 11' \parallel 41.81, 138.19$ | K1 K1 N1 | 5 |

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh |
|---------------|---|--|--------------|
| 10 | $\theta = \frac{2\pi}{6} = \frac{\pi}{3}$ $\frac{1}{2} \times (5r)^2 \times \frac{\pi}{3}$ $\frac{1}{2} \times (5r)^2 \times \frac{\pi}{3} - \frac{1}{2} \times (1.5r)^2 \times \frac{\pi}{3}$ $\frac{91}{24} \pi r^2$ $\left(\frac{91}{24} \pi r^2 \right) \times 3 + \pi r^2$ $\frac{99}{8} \pi r^2$ | N1 K1 K1 N1 K1 N1 | 6 |
| 11 (a) | <p style="text-align: center;"> Nasi Lemak $\left\{ \begin{array}{l} \text{Teh (Nasi Lemak, Teh)} \\ \text{Kopi (Nasi Lemak, Kopi)} \end{array} \right.$ Mi Goreng $\left\{ \begin{array}{l} \text{Teh (Mi Goreng, Teh)} \\ \text{Kopi (Mi Goreng, Kopi)} \end{array} \right.$ Lontong $\left\{ \begin{array}{l} \text{Teh (Lontong, Teh)} \\ \text{Kopi (Lontong, Kopi)} \end{array} \right.$ </p> <p>Bilangan cara : 6</p> | K1 N1 | |
| (b) | $(8 - 1)! = 5040$ $(7 - 1)! \times 2$ 1440 cara | K1 K1 N1 | 5 |

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh |
|---------------|--|------------------------------|--------------|
| 12 (a) | $\vec{OB} = 4i + 3j$ | P1 | 7 |
| (b) | $\vec{BC} = \vec{BA} + \vec{AC}$ $\vec{BC} = -9i + (2i - 5j)$ $\vec{BC} = -7i - 5j$ | K1 N1 | |
| (c) | $\vec{CS} = \vec{CO} + \vec{OS}$ $\vec{CS} = 3i + 2j + (2i + kj)$ $\vec{CS} = 5i + (2 + k)j \dots\dots(1)$ $(6i + 9j)t = 5i + (2 + k)j \dots\dots(2)$ Bandingkan 1 dan 2 $t = \frac{5}{6}$ jam $h = 50$ minit $k = 5.5$ | K1 K1 N1 N1 | |
| 13 (a) | $B(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$ B akan menjadi titik tengah AC. | K1 N1 | |
| (b) | $\frac{4(4t) + 3(3h)}{3+4} = h$ atau $\frac{4(t) + 3(4k)}{3+4} = k$ $16\left(\frac{-5k}{4}\right) = -2h$ atau $4\left(\frac{-2h}{16}\right) = -5k$ $h = 10k$ | K1 K1 N1 | |
| (c) | $\frac{1}{2} [[-4(3) + 5k - 1(-1)] - [-1(5) - 1(3) - 4k]] = 15$ $9k - 3 = 30$ atau $9k - 3 = -30$ $R\left(-1, \frac{11}{3}\right)$ dan $R(-1, -3)$ | K1 K1 N1 | |
| | | | 8 |

| Soalan | Skema Pemarkahan | Sub Markah | Markah Penuh | |
|--------|--|--|--------------|----------------|
| 14 (a) | $2b + 2y + \pi y = 120$ atau $L = 2by + \frac{\pi y^2}{2}$ | K1 | | |
| | $L = 120y - \left(2 + \frac{\pi}{2}\right)y^2$ | N1 | | |
| | (b) | $\frac{dL}{dy} = 120 - (4 + \pi)y$ $120 - (4 + \pi)y = 0$ $y = \frac{120}{4 + \pi}$ | | K1 K1 N1 |
| (c) | $\frac{dL}{dy} = 120 - (4 + \pi)(10)$ $\frac{dL}{dt} = (80 - 10\pi) \times \frac{1}{p}$ $\frac{80 - 10\pi}{p}$ | K1 K1 N1 | 8 | |
| 15(a) | $a > 0$ dan $N > 0$ $a > 0, a \neq 1$ dan $N > 0$ | K1 N1 | | |
| | (b) | penukaran asas menggunakan hukum log $-\frac{2q + p}{2(1 + p)}$ | | K1 K1 N1 |
| | (c) | $\ln 0.3678 = \ln e^{-a\left(\frac{10}{3}\right)}$ $a = \frac{3}{10}$ $1000(2)e^{-\frac{3}{10}(2)} = 1098$ | | K1 N1 N1 |