# SKEMA PEMARKAHAN MATEMATIK TAMBAHAN KERTAS 1

## MPP3 TINGKATAN 5 2021

| No | Skema Pemarkahan | | $\Sigma$ Markah |
|---|---|---|---|
| 1 | (a) $-3$ | N1 | 5 |
| | (b) $a + (15 - 1)(-3) = x$ | K1 | |
| | $a = x + 42$ | N1 | |
| | $\dfrac{20}{2}\left[\, 2(x+42) + (20-1)(-3)\right] = y$ | K1 | |
| | $x = \dfrac{y - 270}{20}$ | N1 | |
| 2 | (a) $p \le x \le q$ | N1 | 6 |
| | (b) $(-8)^2 - 4ac > 0$ | K1 | |
| | $a < \dfrac{16}{c}$ | N1 | |
| | (c) $p + q = \dfrac{8}{a}$, $pq = \dfrac{c}{a}$ | K1 | |
| | $\dfrac{p+q}{pq} = \dfrac{\frac{8}{a}}{\frac{c}{a}}$ $or$ $\left(\dfrac{8}{a}\right)\left(\dfrac{a}{c}\right)$ | K1 | |
| | $\dfrac{p+q}{pq} = \dfrac{8}{c}$ | N1 (LHS = RHS) | |

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| 3 | (a) $2^{4x} \times \left(2^y\right)^2 = 7 + 2^{4x}$ | K1 | |
| | $rs^2 = 7 + r$ | K1 | |
| | $r = \dfrac{7}{s^2 - 1}$ | N1 | |
| | (b) $\dfrac{2+\sqrt{3}}{2-\sqrt{3}} \times \dfrac{2+\sqrt{3}}{2+\sqrt{3}} - \dfrac{2}{\sqrt{3}} \times \dfrac{\sqrt{3}}{\sqrt{3}}$ | P1 | 6 |
| | $\dfrac{(2)^2 + 2(2)\left(\sqrt{3}\right) + \left(\sqrt{3}\right)^2}{(2)^2 - \left(\sqrt{3}\right)^2} - \dfrac{2\sqrt{3}}{\left(\sqrt{3}\right)^2}$ | K1 | |
| | $\dfrac{21 + 10\sqrt{3}}{3}$ | N1 | |
| 4 | (a) $10 = \sqrt{8^2 + (2+k)^2}$ | K1 | |
| | $(k+8)(k-4) = 0$ | K1 | |
| | $k = -8$ , $k = 4$ | N1 | 5 |
| | (b) $7i + (4-k)j$ | K1 | |
| | $k = 4$ | N1 | |

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| **5** | $y = 5 - 2x$ | P1 | |
| | $\dfrac{x}{(5-2x)} - \dfrac{2(5-2x)}{x} + 1 = 0$ | K1 | |
| | $9x^2 - 45x + 50 = 0$ | | |
| | $(3x - 10)(3x - 5) = 0$ atau $x = \dfrac{-(-45) \pm \sqrt{(-45)^2 - 4(9)(50)}}{2(9)}$ | K1 | **5** |
| | atau setara | | |
| | $x = \dfrac{10}{3}$ ; $x = \dfrac{5}{3}$ | N1 | |
| | $y = -\dfrac{5}{3}$ ; $y = \dfrac{5}{3}$ | N1 | |
| **6** | (a) $\tan\theta = \sqrt{t^2 - 1}$ | P1 | |
| | $-\dfrac{\sqrt{t^2 - 1}}{t}$ | N1 | |
| | (b) (i) $\sqrt{t^2 - 1} = 1$ atau $-\dfrac{\sqrt{t^2 - 1}}{t} = -\dfrac{1}{t}$ atau $\dfrac{1}{\sqrt{t^2 - 1}} = 1$ | K1 | **6** |
| | $t = \pm\sqrt{2}$ | N1 | |
| | (ii) $-\dfrac{\sqrt{t^2 - 1}}{t} = -\dfrac{\sqrt{5}}{3}$ dan selesaikan persamaan kuadratik | K1 | |
| | $t = \pm\dfrac{3}{2}$ | N1 | |

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| 7 | (a) $\dfrac{1}{2}\left[\dfrac{4x-1}{x^2-3}\right]$ | K1 | |
| | $-2$ | N1 | |
| | (b) (i) $-24$ | N1 | 6 |
| | (ii) $7-\left[\dfrac{px^2}{2}\right]_1^3=15$ | K1 | |
| | $7-\left(\dfrac{p(3)^2}{2}-\dfrac{p(1)}{2}\right)=15$ | K1 | |
| | $p=2$ | N1 | |
| 8 | (a) $X=\{0,1,2,3,4\}$ | P1 | |
| | (b) (i) $s+\dfrac{5}{72}+t$ | N1 | |
| | (ii) $^3C_3\left(p\right)^3\left(1-p\right)^{3-3}=\dfrac{125}{216}$ | K1 | 4 |
| | $\dfrac{5}{6}$ | N1 | |

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| **9** | (a) $\log_2 y = \frac{1}{2}\log_2 \frac{a}{b} + \frac{3}{2}\log_2 x$ | K1 | |
| | $\frac{3}{2}$ | N1 | |
| | (b) $p = \frac{1}{2}\log_2 \frac{a}{b}$ | N1 | **5** |
| | (c) $c = \frac{1}{2}\log_2 2^5$ | K1 | |
| | $Q\left(0, \frac{5}{2}\right)$ | N1 | |
| **10** | (a) $(6-1)! \times 2$ | K1 | |
| | 240 | N1 | |
| | (b) (i) 210 | N1 | |
| | (ii) $^9C_5 \times {}^{10}C_1$ atau $^9C_6 \times {}^{10}C_0$ | P1 | **6** |
| | $^9C_5 \times {}^{10}C_1 + {}^9C_6 \times {}^{10}C_0$ | K1 | |
| | 1344 | N1 | |
| **11** | (a) $m = 8t - 1$ | N1 | |
| | (b) $m = 8(9) - 1$ | K1 | |
| | $m = 71$ | N1 | **5** |
| | (c) $8t - 1 \geq 239$ | K1 | |
| | $t = 30$ | N1 | |

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| 12 | Titik tengah $=\left(\dfrac{9}{2},4\right)$    **ATAU**   $MP = MQ$        P1 <br><br> Kecerunan serenjang $=\dfrac{1}{2}$ **ATAU** <br><br> $\sqrt{(x-4)^2+(y-5)^2}$   *atau*   $\sqrt{(x-5)^2+(y-3)^2}$    K1 <br><br> $y-4=\dfrac{1}{2}\left(x-\dfrac{9}{2}\right)$ **ATAU** $\sqrt{(x-4)^2+(y-5)^2}=\sqrt{(x-5)^2+(y-3)^2}$   K1 <br><br> $\dfrac{7}{4}$        N1 <br><br> Pembahagi dua sama serenjang $PQ$ **ATAU** garis lurus , $2x-4y+7=0$   N1 | 5 |

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| **13** | (a) $\dfrac{\pi - \alpha}{2}$ **P1** <br><br> $r\alpha + 2r\left(\dfrac{\pi - \alpha}{2}\right) + 2r\left(\dfrac{\pi - \alpha}{2}\right) = 9\dfrac{81}{125}$ **K1** <br><br> $r = \dfrac{1206}{125(2\pi - \alpha)}$ **N1** <br><br> (b) $\angle BAC = 83.64°$ atau $\angle BAC = 1.46^{\,r}$ atau $\angle ACB = 0.841^{\,r}$ **P1** <br><br> $\Delta_{ABC} = \dfrac{1}{2}(6)^2 \sin 83.64°$ **K1** <br><br> *Luas sektor CEF* $= \dfrac{1}{2}(2)^2(1.46)$ atau <br><br> Luas sektor ADE atau BDF $= \dfrac{1}{2}(4)^2(0.841)$ **K1** <br><br> $\dfrac{1}{2}(6)^2 \sin 83.64° - \dfrac{1}{2}(2)^2(1.46) - 2\left[\dfrac{1}{2}(4)^2(0.841)\right]$ **K1** <br><br> 1.513 **N1** | **8** |

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| **14** | (a) $6x - 2x^2 = 0$      K1<br><br>$2x(3-x) = 0$      K1<br><br>$\left(0, \dfrac{1}{2}\right), \left(3, \dfrac{19}{2}\right)$      N1<br><br>(b) $\dfrac{d^2y}{dx^2} = 6 - 4x$ dan 6 **atau** $\dfrac{d^2y}{dx^2} = 6 - 4x$ dan $-6$ **ATAU**<br><br><table><tr><td>$x$</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>$\dfrac{dy}{dx}$</td><td>-</td><td>0</td><td>+</td></tr><tr><td>tangen</td><td>\</td><td>—</td><td>/</td></tr></table> atau <table><tr><td>$x$</td><td>2</td><td>3</td><td>4</td></tr><tr><td>$\dfrac{dy}{dx}$</td><td>+</td><td>0</td><td>-</td></tr><tr><td>tangen</td><td>/</td><td>—</td><td>\</td></tr></table>   K1<br><br>$\left(0, \dfrac{1}{2}\right)$, titik minimum dan $\left(3, \dfrac{19}{2}\right)$ titik maksimum      N1<br><br>(c) $\dfrac{dy}{dx} = 6(2) - 2(2)^2$      P1<br><br>$\delta y = \left[6(2) - 2(2)^2\right] \times 0.01$      K1<br><br>$\dfrac{43}{6} + 0.04 = \dfrac{1081}{150}$      N1 | **8** |

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| 15 | (a)(i) RM160 587.07 | N1 | |
| | (ii) $\log_{10} 120000(1.06)^n > \log_{10} 530000$ atau setara | K1 | |
| | $n\log 1.06 > \log\left(\dfrac{530000}{120000}\right)$ | K1 | |
| | $n = 26$ | N1 | |
| | | | 8 |
| | (b) (i) $\log_{hk} h + \log_{hk} k$ | K1 | |
| | 1 | N1 | |
| | (ii) $3x - 2 = e^1$ | K1 | |
| | 1.573 | N1 | |