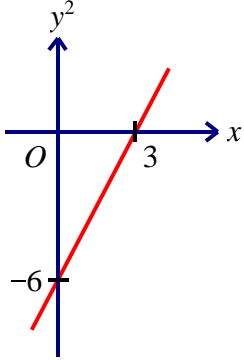
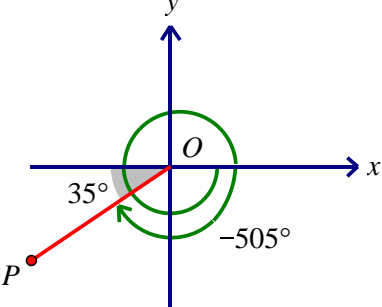
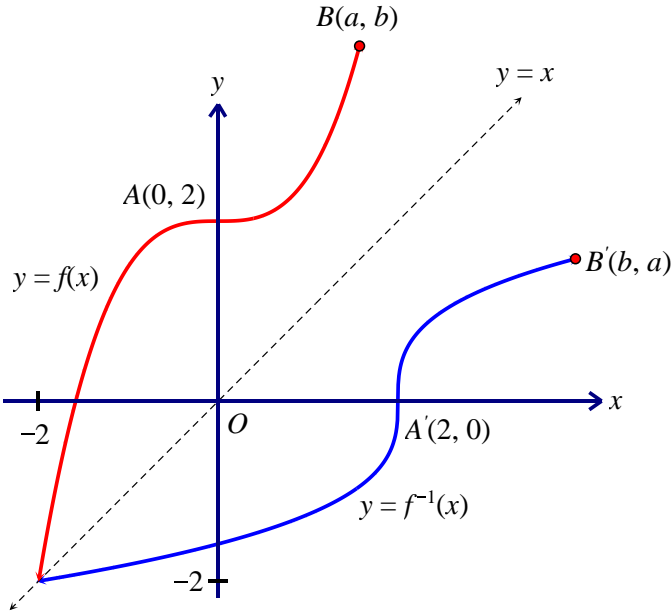
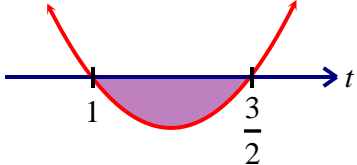


PERATURAN PERMARKAHAN PEPERIKSAAN PERCUBAAN SPM 2024
MATEMATIK TAMBAHAN KERTAS 1 (3472/1)

SOALAN		PENYELESAIAN	MARKAH	JUMLAH MARKAH
1	(a)	$-1 < r < 1$ atau $ r < 1$	N1	3
	(b)	$256 = \frac{64}{1-r}$ $r = \frac{3}{4}$	K1 N1	
2	(a)	<p><u>Guna rumus tembereng garis dan bandingkan x atau y</u></p> $(1, 5) = \left[\frac{0(3) + x(2)}{2 + 3}, \frac{3(3) + y(2)}{2 + 3} \right]$ $\frac{2x}{5} = 1 \quad \text{atau} \quad \frac{9 + 2y}{5} = 5$ $x = \frac{5}{2} \quad \quad \quad y = 8$ $\left(\frac{5}{2}, 8 \right)$	K1 N1	5
	(b)	$2 \times m_2 = -1$ $m_2 = -\frac{1}{2}$ $y - *8 = -\frac{1}{2} \left(x - \frac{*5}{2} \right) \quad \text{atau} \quad *8 = -\frac{1}{2} * \left(\frac{5}{2} \right) + c$ $y - 8 = -\frac{1}{2}x + \frac{5}{4} \quad \quad \quad c = * \frac{37}{4}$ $4y = -2x + 37 \quad \text{atau setara}$	K1 K1 N1	
3	(a)	<p><u>Ganti titik (5,2) atau (11,4) dalam persamaan</u></p> $y^2 = Ax + B$ $2^2 = A(5) + B \quad \text{atau} \quad 4^2 = A(11) + B$ $4 = 5A + B \quad \quad \quad 16 = 11A + B$ <p><u>Selesaikan persamaan serentak dengan penghapusan atau penggantian:</u></p> $12 = 6A \quad \text{atau} \quad 4 = 5A + 16 - 11A$ $A = 2$ $B = -6$	K1 N1 N1	

	(b)	 <p data-bbox="384 488 863 633"> Garis lurus dengan kecerunan positif Pintasan-$y = -6$ *Lukis menggunakan pembaris </p>	<p data-bbox="1230 506 1262 533">P1</p> <p data-bbox="1230 555 1262 582">P1</p>	<p data-bbox="1406 555 1422 582">5</p>
4		<p data-bbox="384 712 687 790"> $-505^\circ = -145^\circ - 360^\circ$ $= -145^\circ$ </p> <p data-bbox="384 813 667 840">Sudut rujukan, $\alpha = 35^\circ$</p>  <p data-bbox="384 1245 970 1384"> Arah putaran ditunjukkan dengan anak panah Sudut rujukan sepadan ditunjuk dengan jelas *lukis menggunakan pembaris </p>	<p data-bbox="1230 813 1262 840">P1</p> <p data-bbox="1230 1267 1262 1294">N1</p>	<p data-bbox="1406 1317 1422 1344">2</p>
5	(a)	<p data-bbox="384 1420 767 1498"> Laju objek, $\underline{v} = \sqrt{3^2 + 4^2}$ $= 5$ unit per saat </p> <p data-bbox="384 1509 576 1644"> $\hat{v} = \frac{1}{5}(3\underline{i} + 4\underline{j})$ $= \frac{3}{5}\underline{i} + \frac{4}{5}\underline{j}$ </p>	<p data-bbox="1230 1420 1262 1447">K1</p> <p data-bbox="1230 1469 1262 1496">N1</p> <p data-bbox="1230 1603 1262 1630">N1</p>	
	(b)	<p data-bbox="384 1684 592 1796"> $\underline{r} = \begin{pmatrix} 2 \\ -1 \end{pmatrix} + t \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ $= \begin{pmatrix} 2 + 3t \\ -1 + 4t \end{pmatrix}$ </p> <p data-bbox="384 1830 783 1953"> Apabila $t = 5$, $\underline{r} = \begin{bmatrix} 2 + 3(5) \\ -1 + 4(5) \end{bmatrix}$ $= \begin{pmatrix} 17 \\ 19 \end{pmatrix}$ </p> <p data-bbox="384 1986 1038 2110"> Zarah berada di sebelah kanan asalan O apabila $y = 0$. Maka, $-1 + 4t = 0$ $t = \frac{1}{4}$ saat </p>	<p data-bbox="1230 1729 1262 1756">K1</p> <p data-bbox="1230 1930 1262 1957">N1</p> <p data-bbox="1230 2033 1262 2060">K1</p> <p data-bbox="1230 2083 1262 2110">N1</p>	<p data-bbox="1406 2074 1422 2101">7</p>

6	(a)	 <p data-bbox="384 772 957 840">Lengkung dipantulkan pada garis $y = x$ Titik $(2, 0)$ dan titik (b, a) ditandakan pada graf</p>	N1 N1	4
	(b)	$a = 1$ $b = 4$	N1 N1	
7	(a)	$\frac{3}{2}$	N1	
	(b)	$g(t) = -\left[t^2 - \frac{5}{2}t - \frac{3}{2}\right]$ $= -\left[t^2 - \frac{5}{2}t + \left(\frac{-5}{2}\right)^2 - \left(\frac{-5}{2}\right)^2 - \frac{3}{2}\right]$ $= -\left(t - \frac{5}{4}\right)^2 + \frac{49}{16}$ $\frac{49}{16}$	K1 N1 N1	
	(c)	$g(t) > 3$ $-t^2 + \frac{5}{2}t + \frac{3}{2} > 3$ $2t^2 - 5t + 3 < 0$ $(2t - 3)(t - 1) < 0$  $1 < t < \frac{3}{2}$	P1 K1 N1	

8	(a)		$X = \{0, 1, 2, 3, 4\}$	N1	4
	(b)		<p>Guna rumus ${}^n C_r p^r q^{n-r} = \frac{1}{64}$</p> ${}^n C_n \left(\frac{1}{4}\right)^n \left(\frac{3}{4}\right)^0 = \frac{1}{64}$ $\left(\frac{1}{4}\right)^n = \frac{1}{64}$ <p>Samakan asas:</p> $\left(\frac{1}{4}\right)^n = \left(\frac{1}{4}\right)^3$ $n = 3$	K1 K1 N1	
9	(a)		$2^x 2^2 - 2^x = 10$ <p>Faktorkan 2^x</p> $2^x(2^2 - 1) = 10$ $2^x(4 - 1) = 10$ $2^x = \frac{10}{3}$	K1 K1 N1	8
	(b)		$9 - x^2 > 0$ $x^2 - 9 < 0$ $0 < x < 3$ $a = 3$	P1 N1 N1	
	(c)		<p><u>Guna hukum log</u></p> $\left(\log_b b^{\frac{1}{2}}\right)^4 \quad \text{atau} \quad 4 \left(\frac{1}{2} \log_b b\right) \quad \text{atau}$ $\log_b b = 1 \quad \text{atau} \quad \log_e e = 1$ 0	K1 N1	
10	(a)		$\frac{dA}{dh} = 10\pi - 2\pi h$ $\frac{dA}{dt} = (10\pi - 2\pi(4))(0.2)$ 0.4π	K1 K1 N1	6
	(b)	(i)	$x^2 + c^*$	N1	
		(ii)	$y = x^2 + 1^*$ atau $y = x^2 + 2^*$ atau setara Keluarga lengkung atau kamiran tak tentu	N1 P1	

11	(a)	(i)	$3! \times {}^4P_3$ 144	K1 N1	7																				
		(ii)	$(3 - 1)! \times {}^3P_3$ 12	K1 N1																					
	(b)		Menggunakan rumus nP_r atau nC_r $\frac{n!}{(n-3)!}$ Atau $\frac{n!}{(n-4)!4!}$ $4 \left[\frac{n!}{(n-3)!} \right] = 24 \left[\frac{n!}{(n-4)!4!} \right]$ $n = 7$	K1 K1 N1																					
12	(a)		$\mu = 48.89$	N1	6																				
	(b)		$0.8413 - 0.5$ 0.3413	K1 N1																					
	(c)		Menggunakan rumus $Z = \frac{x - \mu}{\sigma}$ $\frac{h - 48.89}{16.89}$ Samakan dengan skor-Z daripada jadual taburan normal, -1 $\frac{h - 48.89}{16.89} = -1$ $h = 32$	K1 K1 N1																					
13	(a)		<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td>x</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>y</td> <td>0</td> <td>2</td> <td>2</td> <td>0</td> <td>-4</td> <td>-10</td> <td>-18</td> <td>-28</td> <td>-40</td> </tr> </tbody> </table> 9 nilai betul 5 hingga 8 nilai betul	x	0	1	2	3	4	5	6	7	8	y	0	2	2	0	-4	-10	-18	-28	-40	N1 N1	
	x	0	1	2	3	4	5	6	7	8															
	y	0	2	2	0	-4	-10	-18	-28	-40															
(b)		Skala dan *1 titik diplot betul Semua *9 titik diplot betul Lengkung licin dan melalui semua titik	K1 K1 N1																						
(c)		Melukis garis $y = -2x + 4$ (4, -4) (1, 2)	K1 N1 N1																						

				8
14	(a)	$e^x(2e^{2x} + 3e^x - 5) = 0$ $e^x(2e^x + 5)(e^x - 1) = 0$ $e^x \neq -\frac{5}{2} \text{ (abaikan)}$ $e^x = 1$ <p>Samakan asas:</p> $e^x = e^0$ $x = 0$	<p>K1</p> <p>N1</p> <p>K1</p> <p>N1</p>	8
	(b)	$(\sqrt{3})^2 = t^2 + (\sqrt{2})^2$ $t = 1$ <p>Panjang tiang = $1 + \sqrt{3} \rightarrow 1 + \frac{1}{3}\sqrt{3}$</p> $\frac{4}{3}\sqrt{3}$	<p>K1</p> <p>N1</p> <p>K1</p> <p>N1</p>	

15	(a)	$\angle BAC = \frac{180^\circ - 46^\circ}{2}$ <p>Panjang lengkok $BC = 5(* 1.17)$ Guide: 5.85</p> <p>Perimeter $BAC = 5 + 5 + 5 * (1.17)$</p> <p>15.85</p>	<p>P1</p> <p>K1</p> <p>K1</p> <p>N1</p>	
	(b)	<p>Luas sektor BAC, $L_1 = \frac{1}{2}(5)^2 * (1.17)$ Guide: 14.63</p> <p>Luas tembereng AB, L_2</p> <p>$\frac{1}{2}(6.5)^2(0.803 - \sin 46^\circ)$ atau</p> <p>$\frac{1}{2}(6.5)^2(0.803) - \frac{1}{2}(6.5)^2 \sin 46^\circ$</p> <p>Luas rantau berwarna, $L_1 + L_2$</p> <p>16.40</p>	<p>K1</p> <p>K1</p> <p>K1</p> <p>N1</p>	<p>8</p>