

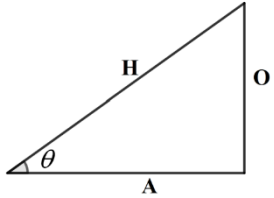
PERATURAN PEMARKAHAN PEPERIKSAAN PERCUBAAN SPM TAHUN 2022

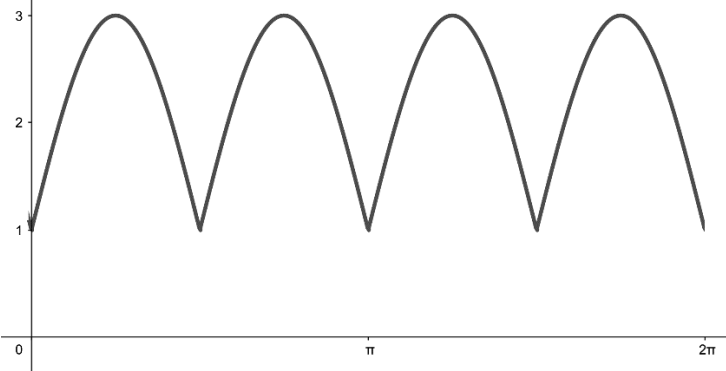
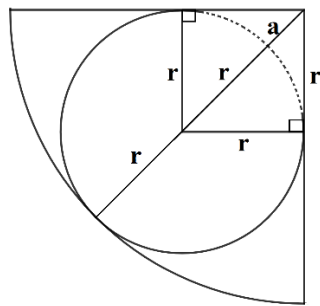
MATEMATIK TAMBAHAN (3472/2)

TINGKATAN 5

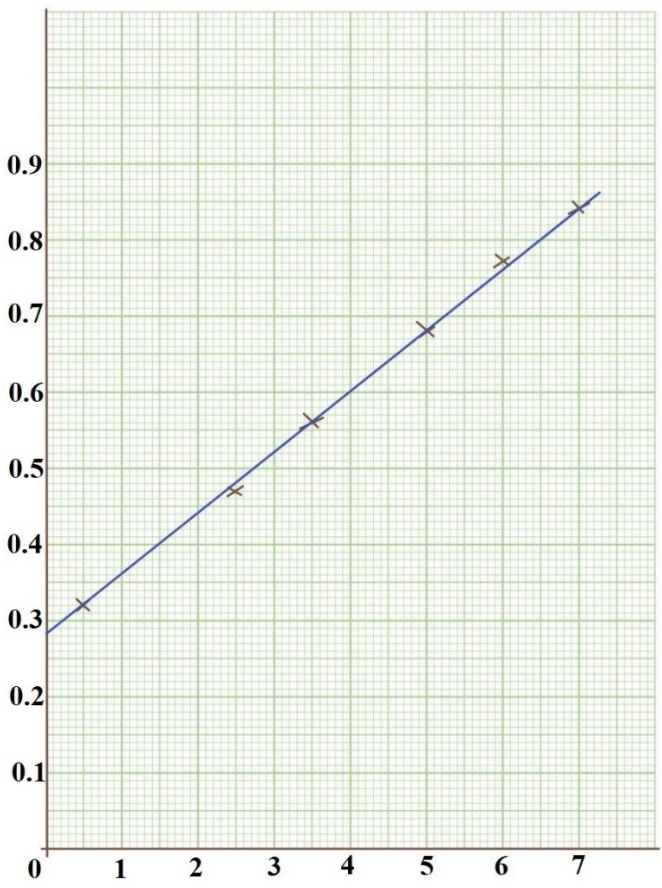
KERTAS 2

NO.	PERATURAN PEMARKAHAN	SUB-MARKAH	MARKAH PENUH
1 (a)	$T_n = 10 + (n-1)(3)$ $T_n = 7 + 3n$	K1 N1	7
1 (b)	$\frac{1}{2}(7+3n)^2 \left(\frac{\pi}{4}\right) = 512\pi$ dan selesaikan n $n = 19$	K1 N1	
1 (c)	$d = 13\left(\frac{\pi}{4}\right) - 10\left(\frac{\pi}{4}\right)$ atau $T_n - T_{n-1}$ $S_{20} = \frac{20}{2} \left(2\left[\frac{5}{2}\pi\right] + (20-1)\left[\frac{3}{4}\pi\right] \right)$ $\frac{385}{2}\pi$	K1 K1 N1	
2 (a)	Midpoint $AC = \left(\frac{7+1}{2}, \frac{7+3}{2}\right)$ atau $m_{AC} = \frac{7-3}{7-1}$ $m_{BD} = \frac{y-5}{0-4} = -\frac{3}{2}$ $B(0,11)$ $\frac{0+x}{2} = 4$ atau $\frac{y+11}{2} = 5$ $D(8,-1)$	K1 K1 N1 K1 N1	8
2 (b)	$BC = \sqrt{(0-7)^2 + (11-7)^2}$ $\frac{52}{2} = \frac{1}{2} \times \sqrt{65} \times t$ $t = 6.450$	K1 K1 N1	

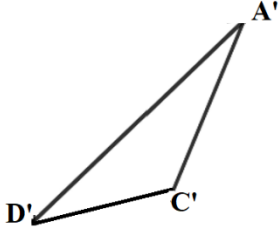
3 (a)	$\frac{1}{2} \times 4x \times 3x \times y = 1500$ $\left(\frac{1}{2} \times 4x \times 3x\right) \text{ dan } (3x \times y) \text{ dan } (4x \times y) \text{ dan } (5x \times y)$ $S = 12x^2 + 12x \left(\frac{750}{3x^2}\right)$ $S = 12x^2 + \frac{3000}{x}, \text{ tertunjuk}$	K1 K1 K1 N1	8
3 (b)	$24x - \frac{3000}{x^2} = 0 \text{ dan selesaikan } x$ $x = 5$ $S = 12(5)^2 + \frac{3000}{5}$ $S = 900$	K1 N1 K1 N1	
4 (a)(i)	${}^{15}C_9 = 5005$	N1	6
4 (a)(ii)	${}^6C_3 \times {}^5C_3 \times {}^4C_3 = 800$	K1N1	
4 (b)	$(4-1)!$ $(4-1)! \times 3! \times 3! \times 3!$ 1296	K1 K1 N1	
5 (a)	 $\sin \theta = \frac{O}{H}, \cos \theta = \frac{A}{H}$ $O^2 + A^2 = H^2$ $\frac{O^2}{H^2} + \frac{A^2}{H^2} = \frac{H^2}{H^2}$ $\left(\frac{O}{H}\right)^2 + \left(\frac{A}{H}\right)^2 = 1$ $\sin^2 \theta + \cos^2 \theta = 1, \text{ terbukti}$	K1 K1 N1	7

5 (b)	 Bentuk Graf Sinus 2 kitaran Amplitude 2 Mutlak DAN anjakan 1 unit ke atas	P1 P1 P1 P1	
6	Hapus anu pertama dengan penggantian @ penghapusan Hapus anu kedua dengan penggantian @ penghapusan $x = 1$ $y = 4$ $z = -2$	K1 K1 N1 N1 N1	5
7 (a)	 $2r + a = 7$ $[r + (7 - 2r)]^2 = r^2 + r^2$ $r = \frac{-14 \pm \sqrt{14^2 - 4(1)(-49)}}{2(1)}$ $r = 2.90$	K1 K1 N1	9
7 (b)	$(7 - 2.90)$ atau $7\left(\frac{\pi}{2}\right)$ atau $2.90\left(\frac{3\pi}{2}\right)$ $perimeter = 2(7 - 2.90) + 7\left(\frac{\pi}{2}\right) + 2.90\left(\frac{3\pi}{2}\right)$	K1 K1	

	$perimeter = 32.86$	N1	
7(c)	$(2.90)^2 \text{ atau } \frac{1}{2}(7)^2 \left(\frac{\pi}{2}\right) \text{ atau } \frac{1}{2}(2.90)^2 \left(\frac{3\pi}{2}\right)$ $\frac{1}{2}(7)^2 \left(\frac{\pi}{2}\right) - \frac{1}{2}(2.90)^2 \left(\frac{3\pi}{2}\right) - (2.90)^2$ $luas = 10.26$	K1 K1 N1	
8 (a)(i)	$\overrightarrow{BC} = \overrightarrow{BA} + \overrightarrow{AC}$ $\overrightarrow{BC} = -6\hat{x} + 4\hat{y}$	K1 N1	
8 (a)(ii)	$\overrightarrow{AT} = 6\hat{x} + \frac{1}{2}(-6\hat{x} + 4\hat{y})$ $\overrightarrow{AT} = 3\hat{x} + 2\hat{y}$	K1 N1	10
8 (b)	$\overrightarrow{AR} = m(3\hat{x} + 2\hat{y})$ $\overrightarrow{AR} = \hat{y} - n(-6\hat{x} + \hat{y})$ $6n = 3m \text{ dan } 1 - n = 2m$ Hapus anu pertama dengan penggantian @ penghapusan $n = \frac{1}{5}$ $m = \frac{2}{5}$	K1 K1 K1 N1 N1	

9 (a)		<table><tr><td>x</td><td>0.5</td><td>2.5</td><td>3.5</td><td>5.0</td><td>6.0</td><td>7.0</td></tr><tr><td>$\log_{10} y$</td><td>0.32</td><td>0.47</td><td>0.56</td><td>0.68</td><td>0.77</td><td>0.84</td></tr></table>	x	0.5	2.5	3.5	5.0	6.0	7.0	$\log_{10} y$	0.32	0.47	0.56	0.68	0.77	0.84		N1	10
x	0.5	2.5	3.5	5.0	6.0	7.0													
$\log_{10} y$	0.32	0.47	0.56	0.68	0.77	0.84													
9 (b)	 Plot $\log_{10} y$ melawan x , (Paksi betul dan skala seragam) 6 titik diplot dengan betul. Garis penyuaian terbaik, (sekurang-kurangnya 5 titik betul).		K1 N1 N1																
9 (c)(i)	$x = 4$		N1																
9 (c)(ii)	$\log_{10} y = (2 \log_{10} q) x + \log_{10} p$ $\log_{10} p = 0.285$ $p = 1.928$		P1 K1 N1																

9 (c)(iii)	$2\log_{10} q = \frac{0.84 - 0.32}{7 - 0.5}$, mana-mana 2 titik pada garis $q = 1.096$	K1 N1	
10 (a)(i)	${}^8C_3(0.8)^3(0.2)^5$ atau ${}^8C_2(0.8)^2(0.2)^6$ atau ${}^8C_1(0.8)^1(0.2)^7$ atau ${}^8C_0(0.8)^0(0.2)^8$ ${}^8C_3(0.8)^3(0.2)^5 + {}^8C_2(0.8)^2(0.2)^6 + {}^8C_1(0.8)^1(0.2)^7 + {}^8C_0(0.8)^0(0.2)^8$ 0.0104	K1 K1 N1	10
10(a)(ii)	$1 - P(X = 0) = 0.92$ $n = 2$	K1 N1	
10 (b)(i)	$\frac{10 - \mu}{\sigma} = -1$ atau $\frac{12 - \mu}{\sigma} = 2$ Hapuskan satu anu menggunakan kaedah penghapusan atau penggantian $\mu = 10.67$ dan $\sigma = 0.665$	K1 K1 N1	
10(b)(ii)	$1 - P(Z \leq -2.511) - P(Z \geq 0.496)$ 68.41%	K1 N1	
11 (a)	$m = \frac{dy}{dx} = \frac{2}{3}(3)$ $\frac{5 - 0}{3 - k} = -\frac{1}{2}$ $k = 13$	K1 K1 N1	10
11 (b)	$\frac{1}{2}(10)(5)$ $\left[\frac{x^3}{9} + 4x \right]_0^3$ $\frac{1}{2}(10)(5) + \left[\frac{x^3}{9} + 4x \right]_0^3$ 40	K1 K1 K1 N1	
11 (c)	$V = \pi \left[\frac{x^5}{45} + \frac{8x^3}{9} + 16x \right]_0^3$	K1	

	$V = \pi \left[\left(\frac{3^5}{45} + \frac{8(3)^3}{9} + 16(3) \right) - 0 \right]$ $V = 77.4\pi$	K1 N1	
12 (a)(i)	$AC^2 = 7.7^2 + 5^2 - 2(7.7)(5) \cos 69^\circ$ $AC = 7.530$	K1 N1	10
12(a)(ii)	$\frac{\sin A}{3.2} = \frac{\sin 111^\circ}{7.530}$ $\angle ACD = 45.63^\circ$	K1 N1	
12(b)(i)	$L = \frac{1}{2}(7.7)(5) \sin 69^\circ$ $L = 17.97$	K1 N1	
12(b)(ii)	$\frac{1}{2}(7.530)t = 17.97$ $t = 4.773$	K1 N1	
12 (c)	 $\angle A'C'D' = 134.37^\circ$	N1 N1	
13 (a)	$a = \frac{dv}{dt} = 5 - 2t$ $14 + 5t - t^2 = 0, \text{ dan selesaikan}$ $a = -9$	K1 K1 N1	
13 (b)	$5 - 2t = 0$ $v = 14 + 5(2.5) - (2.5)^2$ $v = 20.25$	K1 K1 N1	
13 (c)	$\left[14t + \frac{5t^2}{2} - \frac{t^3}{3} \right]$	K1 K1	

	gantian nilai $t = 7$ atau $t = 12$ dlm $\left[14t + \frac{5t^2}{2} - \frac{t^3}{3}\right]$ $\left[14t + \frac{5t^2}{2} - \frac{t^3}{3}\right]_0^7 + \left \left[14t + \frac{5t^2}{2} - \frac{t^3}{3}\right]_7^{12}\right$ $\frac{781}{2} @ 260.33$	K1	
14(a)	$x + y > 18$ atau setara $102x + 75y \leq 2550$ atau setara $y \geq x - 8$ atau setara	N1 N1 N1	
14(b)	Lukis dgn betul sekurang-kurangnya satu garis lurus drp ketaksamaan yg melibatkan x dan y Lukis dgn betul ketiga-tiga garis lurus rantau berlorek	K1 N1 N1	10

14(c)(i)	(14,14) RM72	N1 N1	
14(c)(ii)	$102x + 75y \leq 2550 + 300$ atau garis lurus Bilangan maksimum 19	K1 N1	
15 (a)	$\frac{P_{2011}}{97300} \times 100 = 150$ RM145950	K1 N1	10
15(b)(i)	$\frac{408000}{340000} \times 100$ $x = 120$	K1 N1	
15(b)(ii)	$\frac{(120 \times 4) + (110 \times k) + (130 \times [5 - k]) + (150 \times 1)}{10}$ $\frac{(120 \times 4) + (110 \times k) + (130 \times [5 - k]) + (150 \times 1)}{10} = 124$ $k = 2$	K1 K1 N1	
15 (c)	$\frac{110}{100} \times \frac{140}{100} \times 100$ atau $\frac{130}{100} \times \frac{140}{100} \times 100$ $I_{SD} = 154$ atau $I_A = 182$ $\frac{(120 \times 4) + (154 \times 2) + (182 \times 3) + (150 \times 1)}{10}$ $\bar{I} = 148.4$	K1 N1 K1 N1	