MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

MODUL KOLEKSI ITEM
PERCUBAAN SPM
2026

MATEMATIK TAMBAHAN
KERTAS 1

UNTUK KEGUNAAN PEMERIKSA SAHAJA

SKEMA PEMARKAHAN

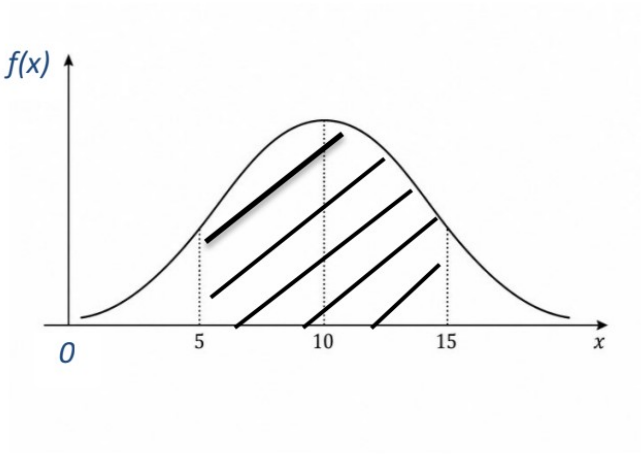
PERATURAN PEMARKAHAN PEPERIKSAAN PERCUBAAN TAHUN2026

MATEMATIK TAMBAHAN (3472/1)

TINGKATAN 5

NO.	PERATURAN PEMARKAHAN	SUB-MARKAH	MARKAH PENUH
1.			
(a)	$p = 4 - q$	N1	
(b)	$(i)\ \ m = 4$	N1	4
	$(ii)\ Ganti\ m = 4\ \ dan\ 7\ ke\ dalam\ f(x) @ -1 \le f(x) \le 8$	K1	
	$-1 \le x \le 8$	N1	
2.			
(a)	$y = (2x - 3)^2$	K1	
	$\sqrt{y} = 2x - 3$	N1	
(b)	$7 = 2\mathrm{k} - 3$	K1	4
	$k = 5$	N1	
3	$60\ @\ \frac{\pi}{3}\ @\ 1.047$	P1	
	Perimeter $= 3.5 + 3.5 + (2\pi - 1.047)(3.5)$ @ 18.33	K1	3
	$= 25.33$	N1	

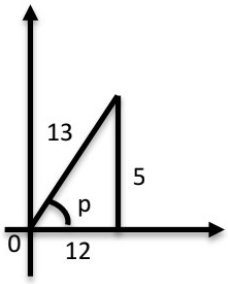
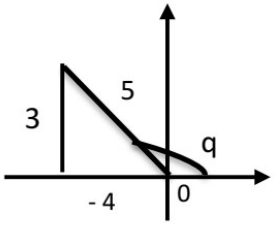
4 (a)	$n = 2k + 1$ $S_A = \frac{2k+1}{2}(2k + 4k)$ $6k^2 + 3k$	 K1 N1	5
(b)	$n = k + 1$ $S_B = \frac{k+1}{2}(2k + 4k)$ $3k^2 + 3k$	 K1 N1	
(c)	$\frac{S_A}{S_B} = \frac{6k^2+3k}{3k^2+3k}$ $= \frac{3k(2k+1)}{3k(k+1)}$ Catatan : mesti melibatkan 2 langkah di atas ini, $=\frac{2k+1}{k+1}$ terbukti	 N1	
5 (a) (i)	${}^{15}C_{10} = \frac{15!}{10!\,(15-10)!}$ 3003	K1 N1	8
(ii)	${}^{9}C_1 \times {}^{8}C_1 or\ {}^{6}C_1 \times {}^{5}C_1 or {}^{11}C_6$ $({}^{9}C_1 \times {}^{8}C_1) \times ({}^{6}C_1 \times {}^{5}C_1) \times {}^{11}C_6$ @ $({}^{9}P_2 \times {}^{6}P_2 \times {}^{11}C_6$ 997920	K1 K1 N1	
(b)	${}^{2}P_2$ *atau* $(9-1)!$ ${}^{2}P_2 \times (9-1)!$ 80640	P1 K1 N1	

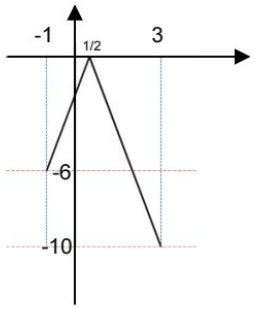
6 (a) (i)	$^8C_5(0.8)^5(0.2)^{8-5}$ *dan* 0.1468	N1	
(ii)	$P(X=6)+P(X=7)+P(X=8)$ Atau $P(Y=2)+P(Y=1)+P(Y=0)$		
	$^8C_6(0.8)^6(0.2)^{8-6}+{}^8C_7(0.8)^7(0.2)^{8-7}+{}^8C_8(0.8)^8(0.2)^{8-8}$	K1	
	0.7969	N1	
(b) (i)	μ = 10	N1	6
(ii)		K1	
	$1-0.28-0.28$ DAN 0.44	N1	

7 (a)	$f(x) = x^2 - 6kx + (\frac{-6k}{2})^2 - (\frac{-6k}{2})^2 + h$ $f(x) = (x - 3k)^2 - 9k^2 + h$ $k + 4 = 3k$ atau $-9k^2 + h = 2k - 9k^2$ $k = 2$ dan $h = 4$ Catatan : $f(x) = 0$, K0K0K0N0	K1 K1 K1 N1	8
(b)	Bentuk U dan menyilang pada paksi-x pada 2 titik Pintasan-y $= (0,4)$ dan titik minimum $= (6, -32)$	P1 P1	
(c)	$f(x) = (x - 2)^2 - 29$ Nilai minimum baharu $= -29$ DAN Paksi simetri $x = 2$	N1 N1	
8 (a)	$\frac{dy}{dx} = (4p + 4)x^p + 6px^{p-1}$ $4p + 4 = q$ dan $6p = q$ $p = 2$, $q = 12$	K1 K1 N1, N1	9
(b) (i)	$\frac{dy}{dx} = (-3)(8)x^{-4}$ $\frac{dy}{dx} = -\frac{24}{x^4}$	K1 N1	
(ii)	$\delta y = \left(-\frac{24}{(2)^4}\right)(-0.2)$ $y_b = y_a + \delta y$ $y_b = \frac{8}{(2)^3} + (0.3)$ 1.30	K1 K1 N1	

9 (a)	$u = 3 - 2x$, $\frac{du}{dx} = -2$, $\frac{dx}{du} = -\frac{1}{2}$, $dx = -\frac{1}{2}du$		
	$\int_0^3 5(3-2x)^{-4}dx = \int_0^3 5u^{-4}\left(-\frac{1}{2}\right)du$	K1	
	$-\frac{5}{2}\left[-\frac{1}{3u^3}\right]_0^3$	K1	
	$-\frac{5}{2}\left[-\frac{1}{3(3-2x)^3}\right]_0^3$		
	$\left(-\frac{5}{2}\left[-\frac{1}{3(3-2(3))^3}\right]\right) - \left(-\frac{5}{2}\left[-\frac{1}{3(3-2(0)^3}\right]\right)$	K1	
	$-\frac{5}{81}$	N1	
(b)	$y = \int 2x - 6dx$		9
	$\frac{dy}{dx} = 0$, $2x - 6 = 0$ $x = 3$	K1	
	$y = x^2 - 6x + c$		
	$(-4) = (3)^2 - 6(3) + c$ $c = 5$	K1	
	$y = x^2 - 6x + 5$	N1	
(c)	$\int_a^3 f(x)dx + [4x]_0^3 = 9$ atau $5 + [4x]_0^3 = 9$	K1	
	$a = 2$	N1	

10	$2^{2m} = a\ , 2^n = b$ $\frac{a^3b^2}{ab^4} = 2^{pm+qn}$ $\frac{(2^{2m})^2}{(2^n)^2} = 2^{pm+qn}$ $2^{4m-2n} = 2^{pm+qn}$ $p = 4\ , q = -2$, (both)	K1 K1 N1	3
11	$\frac{3}{2}log_a 2$ $\frac{3}{2}(p^{-1})$ $\frac{3}{2p}$	K1 N1	2
12	$r\begin{pmatrix}2\\3\end{pmatrix}+s\begin{pmatrix}-2\\1\end{pmatrix}=\begin{pmatrix}6\\5\end{pmatrix}$ Hapuskan 1 pemalar $r = 2$ DAN $s = -1$	K1 K1 N1	3
13 (a)	$\sqrt{(x-2)^2+(y-3)^2}$ atau $\sqrt{(-2-2)^2+(0-3)^2}$ $\sqrt{(x-2)^2+(y-3)^2} = 5$ $x^2+y^2-4x-6y-12=0$ $5^2+h^2-4(5)-6h-12=0$ $(h+1)(h-7)=0$ $h=-1$ dan $h=7$ (b) $\frac{1}{2}\|(2\times 0)+(-2\times -1)+5\times 3)]-[3\times -2)+(0\times 5)+(-1\times 2)]\|$ 12.5	K1 K1 N1 K1 K1 N1 K1 N1	8

14 (a) (i)	 atau  	P1	
	$\tan p = \frac{5}{13}$	N1	
(ii)	$\left(\frac{12}{13}\right)\left(-\frac{4}{5}\right)-\left(\frac{5}{13}\right)\left(\frac{3}{5}\right)$	K1	
	$-\frac{63}{65}$	N1	8
(b)	$kos\, x\left(3\sin x - 1\right) = 0$	P1	
	$x = 90^0 / \frac{1}{2}\pi$	K1	
	$x = 19.47^0 / 0.1082\pi$	K1	
	$x = \frac{1}{2}\pi, \frac{3}{2}\pi, 0.1082\pi, 0.8918\pi$	N1	

15. (a) (i)	 Bentuk V terbalik (pantul pada paksi-x) Pintasan-x =1/2 & Graf dalam domain $-1 \le x \le 3$	P1 P1 N1	
(ii)	$f(x)$ tidak mempunyai fungsi songsang, ujian garis mengufuk memotong graf lebih dari satu titik.	P1	
(b)	Andaikan $\frac{x+1}{2x+1} = y$, terima huruf selain x dan k **DAN** $x = \frac{1-y}{2y-1}$ $f(y) = \frac{2\left(\frac{1-y}{2y-1}\right)-1}{1-\left(\frac{1-y}{2y-1}\right)}$ $\frac{3-4k}{3k-2} = 3$ $k = \frac{9}{13}$ **ATAU** $3 = \frac{2x-1}{1-x}$ $x = 4/5$ $k = \frac{*4/5+1}{2(*4/5)+1}$ $k = \frac{9}{13}$	K1 K1 K1 N1 K1 N1 K1 N1	8