

**PEPERIKSAAN BERSAMA  
SEKOLAH-SEKOLAH MENENGAH KEBANGSAAN KELOMPOK M6  
PPD UTARA SEBERANG PERAI PULAU PINANG**

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**PEPERIKSAAN PERCUBAAN BERSAMA  
SPM 2009**

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**MATEMATIK TAMBAHAN**

Kertas 1

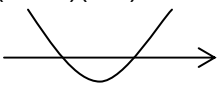
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**SKEMA  
PEMARKAHAN**

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**Kertas soalan ini mengandungi 6 halaman bercetak**

No	Marking Scheme	Marks
1	( a ) 9 ( b ) {5,8,11}	1 1
2	$5(5x - 3) - 3$ $= 25x - 18$	1 1
3	$f^{-1}(x) = \frac{7-5x}{x}$ $f^{-1}(2) = \frac{7-5(2)}{2}$ $f^{-1}(x) = \frac{3}{2}$	1 1 1
4	a) $4x^2 - 11x - 3 = 0$  $(4x+1)(x-3) = 0$ $X = -1/4$ or $x = 3$  b) $b^2 - 4ac = 0$  $p^2 - 4(2)(q) = 0$ $p^2 - 8q = 0$ $q = p^2/8$	1 1  1 1
5	$f(x) = x^2 - 6x + 7$ $X^2 - 6x + (-6/2)^2 - (-6/2)^2 + 7$ $(x-3)^2 - 2$ Compare with $f(x) = (x-h)^2 + k$ $h = 3$ and $k = -2$	1 1 1
6	$2x^2 > 5x + 3$ $2x^2 - 5x - 3 > 0$ $(2x+1)(x-3) > 0$  $x > 3$ or $x < -1/2$	1 1 1

7	$\log_2(x-3) + 2 = \log_2(x+6)$ $\log_2(x-3) + \underline{2\log_2 2} = \log_2(x+6)$ $\log_2(x-3) + \underline{\log_2 2^2} = \log_2(x+6)$ $\log_2 4(x-3) = \log_2(x+6)$ $4(x-3) = x+6$ $4x-12 = x+6$ $3x = 18$ $\underline{x = 6}$	1 1 1    1
8	$216^x - 36^{x+3} = 0.$ $216^x = 36^{x+3}$ $6^{3x} = 6^{2(x+3)}$ $3x = 2(x+3)$ $3x = 2x+6$ $x = 6$	1  1  1
9	$d = 5x+y - (x+y)$ $= 4x$	1 1
10	$a = 90, d = -3$ $90 + (n-1)(-3) = 36$ $n = 17$	1  1
11	$\frac{a}{1 - \frac{1}{3}} = 27$ $a = 18$	1  1
12	a ) $\log_{10} y = \log_{10} a + 3\log_{10} x$ b) i. $\log_{10} a = 2$ $\log_{10} y = 2 + 3\log_{10} x$ ii. $6 = 2 + 3h$ $h = \frac{4}{3}$	1  1  1
13	a. ) $y\sqrt{x} = 3-x$ b. ) gradient = -1 y-intercept = 3	1 1 1

14	$PA=2PB$  $\sqrt{(x-3)^2 + (y-4)^2} = 2\sqrt{(x+2)^2 + (y-1)^2}$  $3x^2 + 3y^2 + 22x - 5 = 0$	1, 1  1
15	(a) $\overrightarrow{PQ} = \overrightarrow{PO} + \overrightarrow{OQ}$ $= (3i + -4j) + (6i + -7j)$ $9i - 11j$  (b) $ \overrightarrow{PQ}  = \sqrt{9^2 + 11^2} = \sqrt{202}$  Unit vector $= \frac{1}{\sqrt{202}} (9i - 11j)$	1  1  1
16	(a) $\overrightarrow{QS} = \overrightarrow{QP} + \overrightarrow{PS}$ $= -4\underline{a} + 6\underline{b}$  (b) $\overrightarrow{PA} = \overrightarrow{PQ} + \overrightarrow{QA}$ $= 4\underline{a} + \frac{2}{3}\overrightarrow{QS}$ $= 4\underline{a} + \frac{2}{3}(-4\underline{a} + 6\underline{b})$ $= \frac{4}{3}\underline{a} + 4\underline{b}$	1  1  1  1
17	$\tan^2 A - 2 \sec A = 2$ $(\sec^2 A - 1) - 2 \sec A - 2 = 0$ $\sec^2 A - 2 \sec A - 3 = 0$ $(\sec A + 1)(\sec A - 3) = 0$  $\sec A + 1 = 0$ , $\sec A - 3 = 0$  $\frac{1}{\cos A} = -1$ $\frac{1}{\cos A} = 3$  $\cos A = -1$ $\cos A = \frac{1}{3}$  $A = 180^\circ$ , $A = 70.53^\circ, 289.47^\circ$	1 1   1   1

18	(a)	
	$\frac{1}{2}(2j^2)\theta = \frac{1}{2}(j^2)\left(\frac{\pi}{2}\right)$ $\theta = 0.3927$	1
	(b) $s = r\theta$ $= \frac{9}{8}\pi = 3.534 \text{ cm}$ Perimeter of sector POQ = 9 + 9 + 3.534 = 21.534 cm	1 1
19	When $x=3, 2kx-8=4$	1
	$6k=12$ $K=2$	1
20	$y = 4x^3 - 7x^2 + 1$ $\frac{dy}{dx} = 12x^2 - 14x$ When $x=2, \frac{dy}{dx} = 12(2)^2 - 14(2)$ $= 20$ $\delta y = 2.1 - 2.0 = 0.1$ Using $\delta y = \frac{dy}{dx} \times \delta x$ $0.1 = 20 \times \delta x$ $\delta x = 0.005$	1 1 1
21	$-2m + [7(3) - 7(4)] = 17$ $-2m - 7 = 17$ $m = -12$	1, 1 1 1
22	Variance, $\sigma^2 = \frac{1020}{6} - (11)^2$ $= 170 - 121$ $= 49$	1, 1 1
23	(a) ${}^5P_5 = 120$	1
	(b) ${}^5P_5 - (2 \times {}^4P_4) = 120 - 48$	1, 1
	$= 72$	1

24	$P(X \geq 2)$ $= 1 - P(X = 0) - P(X = 1)$ $= 1 - (0.9)^5 - {}^5C_1 (0.1)(0.9)^4$ $= 1 - 0.5905 - 0.3281$ $= 0.0814$	1 1 1 1
25	<p>(a) <math>P(X &gt; k) = 0.2543</math></p> $P\left(Z > \frac{k-55}{4}\right) = 0.2543$ $\frac{k-55}{4} = 0.661$ $k = 55 + 4(0.661)$ $= 57.644$ <p>b.) <math>P(-k \leq X \leq k) = 0.6872</math></p> $1 - 2P(X \geq k) = 0.6872$ $P(X \geq k) = 0.1564$ $P\left(Z \geq \frac{k-55}{4}\right) = 0.1564$ $\frac{k-55}{4} = 1.009$ $k = 55 + 4(1.009)$ $= 59.036$	1  1   1   1