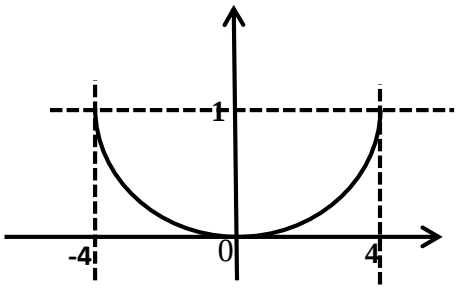
SKEMA PEMARKAHAN

PEPERIKSAAN PERCUBAAN SPM

MATEMATIK TAMBAHAN TINGKATAN 5 TAHUN 2017

KERTAS 2

No.	MARKING SCHEME	MARKS	Σ MARKS
1.	(a) (i) $A(-4, 0)$ atau $C(0, 8)$ atau $\left(\frac{-4+0}{2}, \frac{0+8}{2}\right)$ $B(-2, 4)$ (ii) kec BE $= -\frac{1}{2}$ persamaaan : $y-0 = -\frac{1}{2}(x+4)$ atau $0 = -\frac{1}{2}(-4) + c$ $y = -\frac{1}{2}x - 2$ atau setara (b) $0 = \frac{1(x) + 4(-2)}{1+4}$ atau $3 = \frac{4(4) + 1(y)}{1+4}$ $E(8, -1)$	P1 P1 P1 K1 N1 K1 N1	7
2.	(a) $A_1 = \pi k^2$, $A_2 = \frac{\pi k^2}{4}$, $A_3 = \frac{\pi k^2}{16}$, $A_4 = \frac{\pi k^2}{64}$ $r = \frac{1}{4}$ $\frac{a\left[1-\left(\frac{1}{4}\right)^4\right]}{1-\frac{1}{4}} = \frac{2125}{16}\pi$ $a = 100\pi \text{ cm}^2$ (b) $100\pi \left(\frac{1}{4}\right)^{n-1} = \frac{25}{4}\pi$ or $T_2 = 100\pi\left(\frac{1}{4}\right)$ $n = 3$ (c) $S_\infty = \frac{100\pi}{1-\frac{1}{4}}$ $= 400\pi \ cm^2$	P1 K1 N1 K1 N1 K1 N1	7

3.	$y = \frac{8-4x}{3}$ or $x = \frac{8-3y}{4}$ $x^2 + x\left(\frac{8-4x}{3}\right) = 8$ or $\left(\frac{8-3y}{4}\right)^2 - \left(\frac{8-3y}{4}\right)y = 8$ $7x^2 - 8x - 24 = 0$ or $21y^2 - 80y - 64 = 0$ $x = \frac{(-8)\pm\sqrt{(-8)^2-4(7)(-24)}}{2(7)}$ or $y = \frac{(-80)\pm\sqrt{(-80)^2-4(21)(-64)}}{2(21)}$ $x = 2.51, \quad -1.37$ or $y = 4.49, \ -0.679$ $y = -0.680, \ 4.49$ or $x = -1.37, \ 2.51$	P1 K1 K1 N1N1	5
4.	(a)  $y = kx^2$ pada titik (4,1) $1 = k(4)^2$ $k = \frac{1}{16}$	K1 N1	7
	(b) $(10 \times 8) - \int_{-4}^{4} \frac{1}{16} x^2$ $80 - \left[\frac{1}{48}x^3\right]_{-4}^{4}$ $80 - \left[\left(\frac{4}{3}\right) - \left(\frac{-4}{3}\right)\right]$ $77\frac{1}{3}$	K1 K1K1 K1 N1	

5.	(a) | Marks	Cumulative frequency	Frequency
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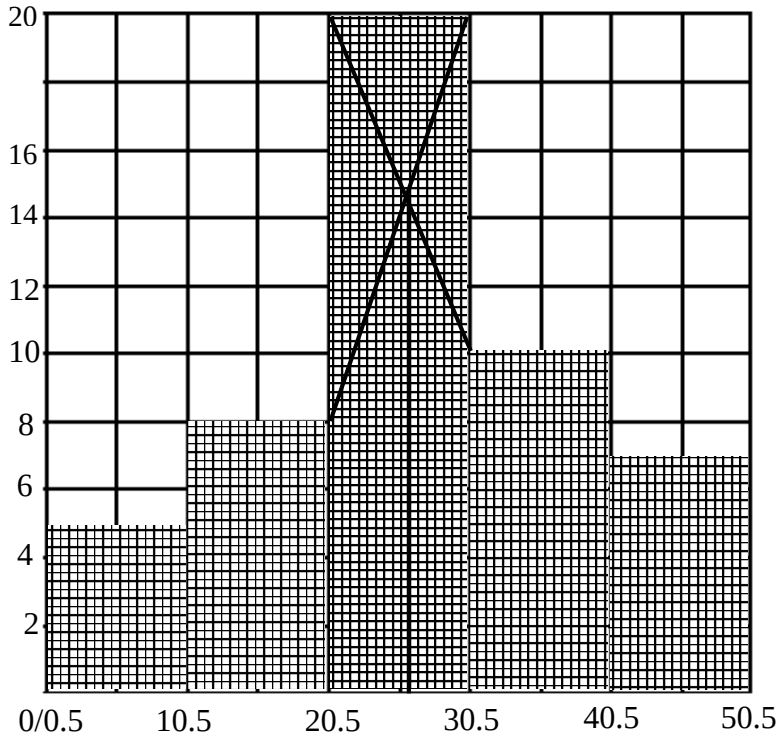
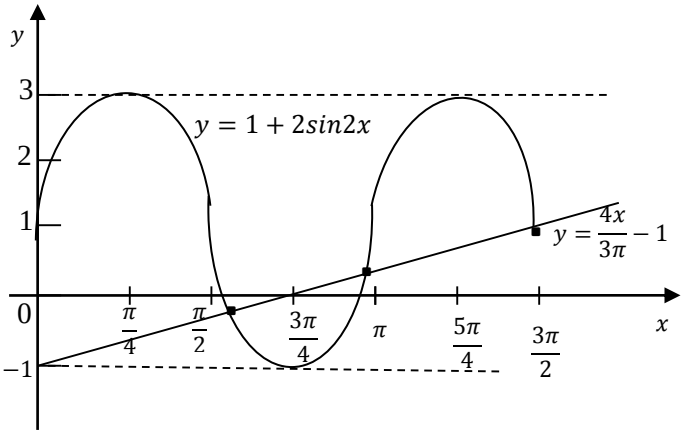
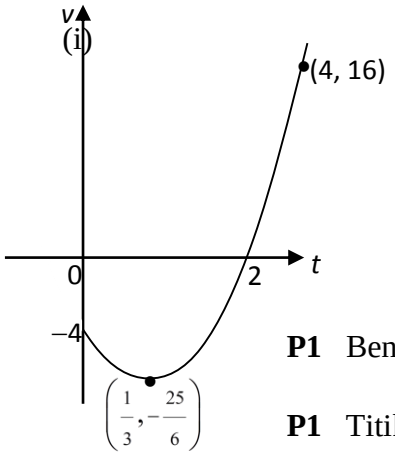
1 -10	*5*	**5**
11 – 20	*13*	**8**
21 – 30	*33*	**20**
31 – 40	*43*	**10**
41 - 50	*50*	**7**		N1	6
	(b) $median = 20.5 + \left(\frac{\frac{1}{2}(50) - 13}{20} \right) 10$ 26.5		K1 N1	
	(c)  Markah mod = 26.5		K1 K1 N1	

6.	a) $\frac{6}{2(2)-b} = -1$ $2y + b = -2$ $a = -6, b = 10$	K1 K1 N1N1	8
	b) $g^{-1}(x) = \frac{10-x}{6}$	K1N1	
	c) $= \frac{6}{2(\frac{10-x}{6})-10}$ $hg^{-1}(x) = -\frac{18}{x+20}, x \neq -20$	K1 N1	
7.	a) i) $\overrightarrow{BO} + \overrightarrow{OC}$ @ $\overrightarrow{OB} + \overrightarrow{BM}$ $-8\underset{\sim}{y} + 4\underset{\sim}{x}$ ii) $4\underset{\sim}{y} + 6\underset{\sim}{x}$ b) $\overrightarrow{ON} = h\left(4\underset{\sim}{y} + 6\underset{\sim}{x}\right)$ $\overrightarrow{ON} = 4\underset{\sim}{x} + k\left(8\underset{\sim}{y} - 4\underset{\sim}{x}\right)$ $6h = 4 - 4k$ $h = \frac{1}{2}$ $k = \frac{1}{4}$ c) $\sqrt{(-8(2))^2 + (4(3))^2}$ 20	K1 N1 N1 K1 K1 K1 N1 N1 K1 N1	10

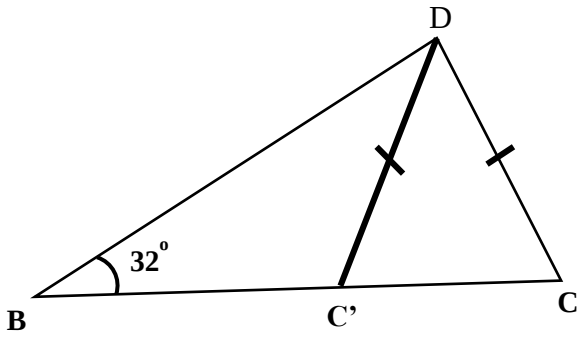
8.	(a) $\frac{1}{tanx}(2sin^2x)$ $\frac{cosx}{sinx}(2sin^2x)$ $2sinxcosx$ $\boldsymbol{sin2x}$	K1 K1 N1	
	(b)  Shape (sine) Cycle (1.5 cycles) Maximum 3 and minimum -1 Shifted in range $0 \leq x \leq \frac{3}{2}\pi$ $y = \frac{4x}{3\pi} - 1$ Draw the straight line $y = \frac{4x}{3\pi} - 1$ Number of solutions =3	P1 P1 P1 P1 N1 K1 N1	10
9.	a) $\boldsymbol{x^2}$: 1, 4, 9, 16, 25, 36 $\boldsymbol{xy}$: 5.60, 13.10, 25.59, 41.52, 65.60, 93.12 b) $y = \frac{a}{x}\ x + bx$ $xy = bx^2 + a$ (i) a = pintasan-y $= 3 \leq a \leq 4$ (ii) b = kecerunan graf $= \frac{93.12-3}{36-0}$ $= 2.50$	N1 N1 P1 N1 K1 N1	10

	(iii) apabila $x = 4.9, x^2 = 24.01$ berdasarkan graf, apabila $x^2 = 24.01, xy = 63$ $4.9y = 63$ $y = 12.86$	 K1 N1	
10.	(a) $n = 10 \quad p = 0.15 \quad q = 0.85$ (i) $P(X = 4) = {}^{10}C_4(0.15)^4(0.85)^6$ $= 0.0401$ (ii) $P(X < 3) = P(X = 0) + P(X = 1) + P(X = 2)$ $= {}^{10}C_0(0.15)^0(0.85)^{10} + {}^{10}C_1(0.15)^1(0.85)^9 + {}^{10}C_2(0.15)^2(0.85)^8$ $= 0.8202$	K1 N1 P1 K1 N1	10
	(b) $\mu = 3\,kg \quad \sigma = 0.65\,kg$ (i) $P(X > 4) = P\left(Z > \frac{4-3}{0.65}\right)$ $= P(Z > 1.538)$ $= 0.0620$ (ii) $P(X < 2) = P\left(Z < \frac{2-3}{0.65}\right)$ $= P(Z < -1.538)$ $= P(Z > 1.538)$ $= 0.0620$ Bilangan durian $= 500 \text{ x } 0.062$ $= 31$	K1 N1 N1 K1 N1	

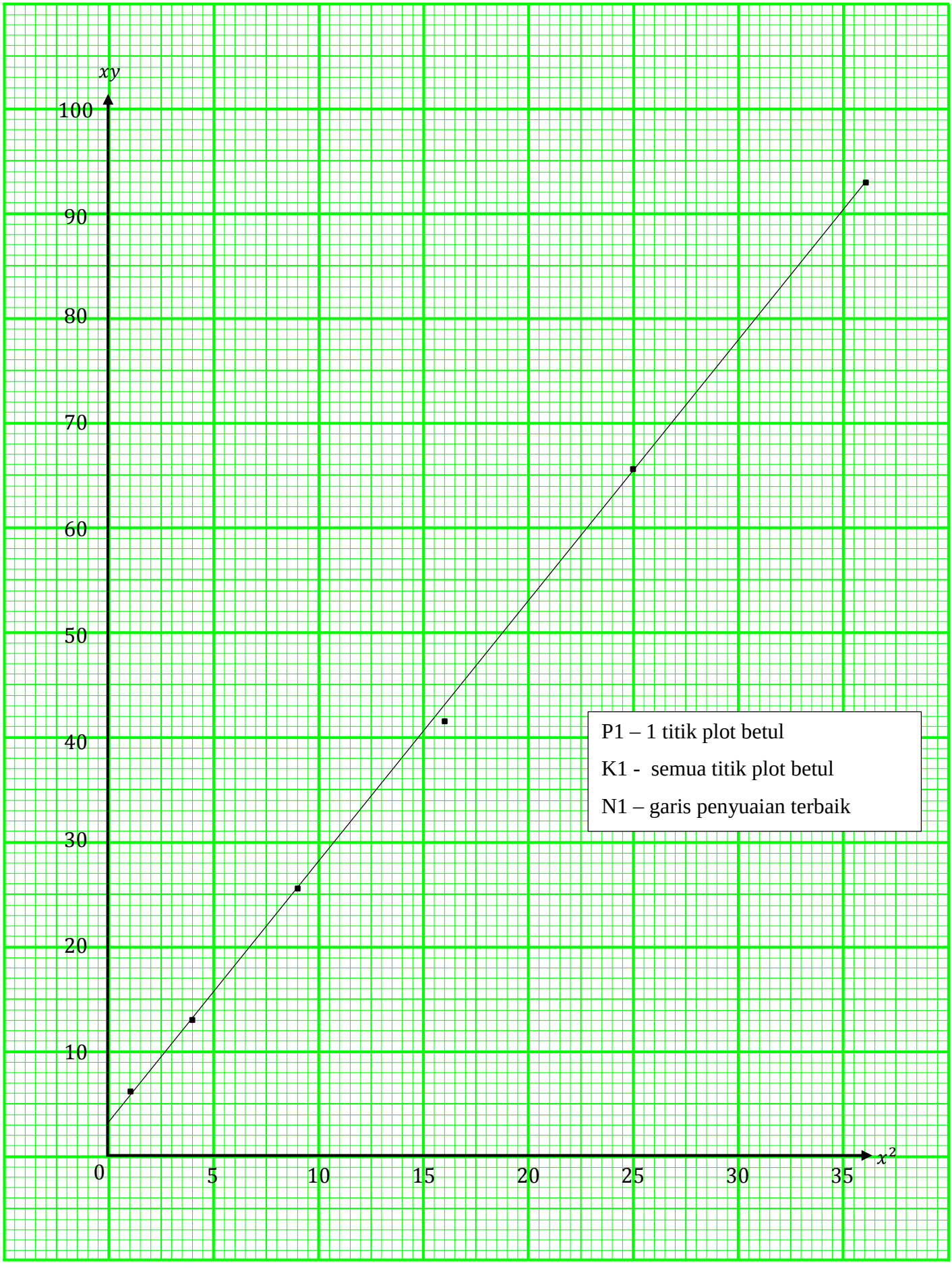
11.	(a) $\tan^{-1}\frac{15}{8}$ $= 61.93^0$ =1.081 rad	K1 N1	10
	(b) $S_{AB} = 10\left(\frac{50}{180}\times\pi\right) = 8.728$ or $8 \times 1.081 = 8.648$ $EC^2 = 15^2 + 8^2 = 17$ Perimeter kawasan berlorek $= 10 + 8.728 + 5 + 9 + 8.648$ $= 41.376$	K1 K1 K1 N1	
	(c) Area $OAB = \frac{1}{2}(10^2)(0.8728)$ or Area $OED = \frac{1}{2}(8^2)(1.081)$ $= 43.64$ $= 34.59$ Area $\Delta = \frac{1}{2}(8)(15)$ or $\frac{1}{2}(8)(17)\sin 1.081$ $= 60$ Luas kawasan bwelorek $= 43.64 + (60 - 34.592)$ $= 69.048$	K1 K1 K1 N1	
12.	(a) $a = pt + q$ $v = \int (pt+q)\,dt$ Guna $v = \int a\,dt$ $v = \frac{pt^2}{2} + qt + c$ $t = 0,\ v = -4,\ c = -4$ $v = \frac{pt^2}{2} + qt - 4$ $v = 0,\ t = 2 \rightarrow 2p + 2q = 4$ Kedua-dua persamaan $v = 16,\ t = 4 \rightarrow 8p + 4q = 20$ <u>atau</u> setara Selesaikan persamaan serentak (sehingga tinggal satu anu) $p = 3$ <u>dan</u> $q = -1$	K1 N1 P1 K1 N1	10

	(b) (i)  **P1** Bentuk U **P1** Titik $\left(\frac{1}{3},-\frac{25}{6}\right)$ dan dua titik lain sama ada (0, −4), (2, 0), (4, 16) (ii) Jumlah jarak yang dilalui $= \left\lvert \int_0^2 (\frac{3}{2}t^2 - t - 4)\,dt \right\rvert + \int_2^4 (\frac{3}{2}t^2 - t - 4)\,dt$ Guna $s = \int v\,dt$ untuk salah satu $= \left\lvert \left[\frac{3t^3}{2(3)} - \frac{t^2}{2} - 4t\right]_0^2 \right\rvert + \left[\frac{3t^3}{2(3)} - \frac{t^2}{2} - 4t\right]_2^4$ Menambah luas $= \lvert -6 \rvert + \left[8 - (-6)\right]$ $= 20$	K1 K1 N1	
13.	a) $h = \frac{1.80}{1.50} \times 100$ $= 120$ $\frac{0.90}{k} \times 100 = 112.5$ $k = \frac{0.90 \times 100}{112.5}$ $k = 0.80$ b) $= \frac{150(30)+120(45)+112.5(15)+105(10)}{100}$ $= 126.38$	KI N1 N1 K1 N1	10

	c) (i) indeks gubahan $= 126.38 \times \frac{150}{100}$ $= 189.57$ (ii) $\frac{Q_{2009}}{RM25} \times 100 = 189.57$ $Q_{2009} = \frac{RM25 \times 189.57}{100}$ $= RM47.39$	K1 N1 K1 K1 N1	
14.	(a) $x + y \leq 80$ $y - x \geq 5$ $80x + 40y \geq 3200$	N1 N1 N1	10
	(b) • 1 graph correct • 3 graph correct • correct area	P1 K1 N1	
	(c) (i) 30 (ii) max point $(37,\ 42)$ $k = 80(x) + 40(y)$ Max fees $= 80(42) + 40(37)$ $= RM4840$	N1 P1 K1 N1	
15.	(a)(i) $13^2 = 7.5^2 + 9^2 - 2(7.5)(9)kos\angle BAD$ $\angle BAD = 103.6^0$ $\frac{\sin\angle BCD}{13} = \frac{\sin 32^0}{7.95}$ $\angle BCD = 60.06^0$ (ii) $\frac{1}{2}(13)(15)\sin 32$ or $\frac{1}{2}(7.5)(9)\sin 103.6$ Luas ABCD $= \frac{1}{2}(13)(15)\sin 32^0 + \frac{1}{2}(7.5)(9)\sin 103.6^0$ $= 84.47cm^2$	K1 N1 K1 N1 K1 K1 N1	10

	(b)(i)  (ii) $\angle BCD = 180^0 - 60.06^0$ $= 119.94^0$	N1 K1 N1	

Soalan no. 9


xy
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
30
35
x^2
P1 – 1 titik plot betul
K1 - semua titik plot betul
N1 – garis penyuaian terbaik