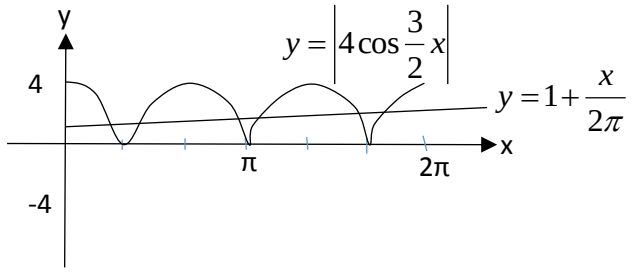
SKEMA PEMARKAHAN MATEMATIK TAMBAHAN KERTAS 2
PERCUBAAN SPM 2019 (SMK KULIM)

No.	Solution & mark scheme		Sub marks	Total marks
1.	(a) 		4	7
	Shape (cosine)	P1		
	Cycle (1.5 cycles)	P1		
	Amplitude	P1		
	Modulus	P1		
	(b) $y=1+\frac{x}{2\pi}$	N1	3	
	Draw line $y=1+\frac{x}{2\pi}$	N1		
	No. of solutions = 6	N1		
2.	(a) $5000(1.07)^n > 10000$	K1	3	8
	$n\log_{10}1.07 > \log_{10}10000$ or n >10.24	K1		
	n=11	N1		
	(b) $x=\log_3 h \qquad y=\log_3 k$	P1P1	5	
	$\log_9 9+\log_9 h^2-\log_9 k$	K1		
	$1+2\left(\frac{\log_3 h}{\log_3 9}\right)-\left(\frac{\log_3 k}{\log_3 9}\right)$	K1		
	$1+x-\frac{y}{2}$	N1		
3.	$x=3y-1$	P1	6	6
	$2(3y-1)^2+11y^2+(3y-1)+2y=0$	K1		
	$y(29y-4)=0$ or $y=\frac{-(-4)\pm\sqrt{(-4)^2-4(29)(0)}}{2(29)}$	K1		
	$y=0$, $\frac{4}{29}$ @ 0.1379	N1		

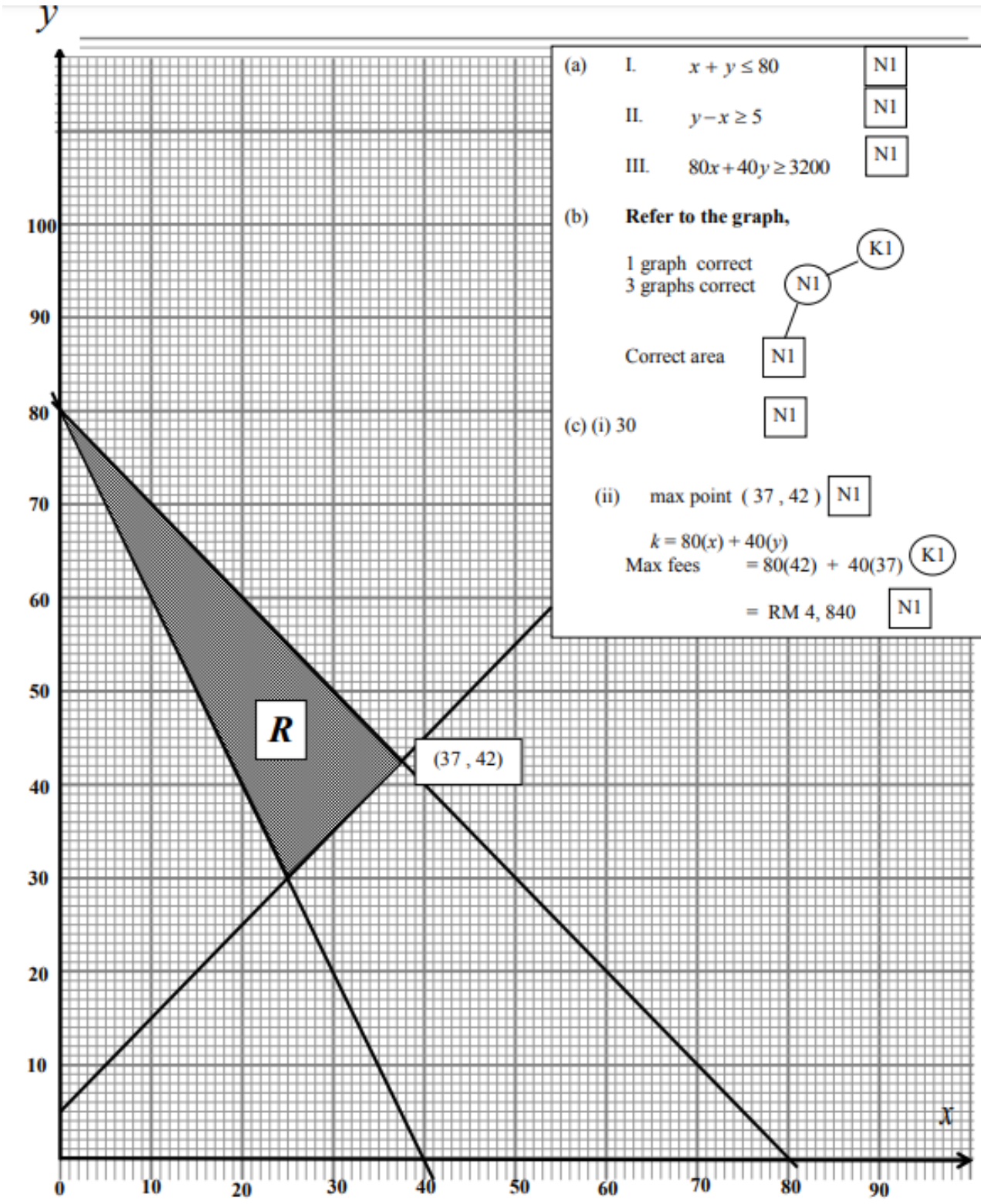
	$x=-1,\ \ \frac{-17}{29}$ @ - 0.5862	N1		
	Intersection points (--1,0) , $\left(\frac{-17}{29},\frac{4}{29}\right)$	N1		
4.	(a) L=34.5 or F=19 or c=5	P1	3	7
	$37.5=34.5+\left(\frac{\frac{1}{2}(75+m)-19}{8}\right)(5)$	K1		
	m = 11	N1		
	(b) x= 27, 32, 37, 42, 47, 52	P1	4	
	$\bar{x}=\frac{(27\times6)+(32\times13)+(37\times40)+(42\times11)+(47\times8)+(52\times8)}{6+13+40+11+8+8}$	K1		
	= 38.51			
	$\sigma=\sqrt{\frac{131154}{86}-38.51^2}$	K1		
	= 6.483	N1		
5.	(a) a = πr OR d= 2π	P1	4	6
	$500\pi=\frac{20}{2}[2(\pi r)+19(2\pi)]$	K1		
	r = 6	K1		
	6π	N1		
	(b) $1050\pi=\frac{n}{2}[2(6\pi)+(n-1)(2\pi)]$	K1	2	
	n = 30	N1		
6.	(a) $h=\frac{1}{2}$	P1	1	6
	(b) Eq QR: $y=\frac{1}{2}x+\frac{9}{2}$ OR Eq PR: $y=\frac{3}{2}x-\frac{1}{2}$	K1	3	
	Solve simultaneous eq $\frac{1}{2}x+\frac{9}{2}=\frac{3}{2}x-\frac{1}{2}$	K1		
	R(5,7)	N1		

	(c) $\frac{1}{2}\left\|4-7+5+1-20-7\right\|$	K1	2	
	12 unit^2	N1		
7.	(a)			10
	Use p=0.85 and q=0.15	P1	4	
	${}^8C_6(0.85)^6(0.15)^2$ OR ${}^8C_7(0.85)^7(0.15)^1$ OR ${}^8C_8(0.85)^8(0.15)^0$	K1		
	$P(X \geq 6) = P(X=6)+P(X=7)+P(X=8)$	K1		
	0.8948	N1		
	(b)(i) $P(35 \leq X \leq 66) = P\left(\frac{35-48}{6} \leq Z \leq \frac{66-48}{6}\right)$	K1	6	
	$= P(-2.167 \leq Z \leq 3)$			
	= 0.9835	K1		
	0.9835 X 180 = 177	N1		
	(ii) $P(X \leq m) = 0.05$	K1		
	$\frac{m-48}{6} = -1.645$	K1		
	m = 38.13	N1		
8.	(a) $\sin x = \frac{4}{14}$			10
	$x = 16.60^o$	K1	2	
	$\theta = (90^o + 16.60^o) \times \frac{3.142}{180}$			
	= 1.861 rad	N1		
	(b) AB = 13.42	P1	4	
	5(1.861) OR 9(1.281)	K1		
	13.42 + 9.305 + 11.53	K1		
	=34.25 @ 34.26	N1		
	(c) $\frac{1}{2}(5+9)(13.42)$	K1	4	
	= 93.94			
	$\frac{1}{2}(5)^2(1.861)$ OR $\frac{1}{2}(9)^2\left(73.40 \times \frac{3.142}{180}\right)$	K1		
	$\frac{1}{2}(5+9)(13.42)$ -- $\frac{1}{2}(5)^2(1.861)$ -- $\frac{1}{2}(9)^2\left(73.40 \times \frac{3.142}{180}\right)$	K1		
	18.79 @ 18.80	N1		

9.	Rujuk lampiran			10
10.	(a) (i) $\overrightarrow{QR}$ = 4$\underline{b}$ 8$\underline{a}$ + 4$\underline{b}$ (ii) 8$\underline{a}$ – 10$\underline{b}$ (b)(i) PT = 8*m*$\underline{a}$ + 4*m*$\underline{b}$ (ii) PT = 10$\underline{b}$ + *n*(8$\underline{a}$ – 10$\underline{b}$) PT= 8*n*$\underline{a}$ + (10 – 10*n*)$\underline{b}$ (c) 8*m* = 8*n* *or* 4*m* = 10 – 10*n* Solve to find *m* and *n* *m* = $\frac{5}{7}$ *n* = $\frac{5}{7}$	N1 N1 N1 N1 N1 N1 K1 K1 N1 N1	3 3 4	10
11.	(a) (i) $2=-1(2)+c$ or $y-2=-1(x-2)$ $y=-x+4$ (ii) $y=\frac{x^2}{4}+c$ $y=\frac{x^2}{4}+1$ (b) $\left[\frac{x^3}{12}+x\right]_0^2$ OR $\frac{1}{2}\times 2\times 2$ or 2 $\frac{8}{3}+2$ $\frac{14}{3}$ (c) $\pi\left[\frac{4y^2}{2}-4y\right]_1^2$ $\pi\left[\left[2(2)^2-4(2)\right]-\left[2(1)^2-4(1)\right]\right]$ 2π	K1 N1 K1 N1 K1 K1 N1 K1 K1 N1	4 3 3	10
12.	(a) $x=\frac{8.25}{7.50}\times 100$ *x* = 110 $\frac{130(5)+120(2)+110(y)+105(3)+125(4)}{14+y}=118.25$ y = 6	K1 N1 K1 N1	4	10

	(b) $\frac{16}{100}\times 105$ RM16.80	K1 N1	2	
	(c) $\frac{540}{100}\times 118.25$ RM638.25	K1 N1	2	
	(d) $\frac{125\times 115}{100}$ or 143.75 RM37.38	K1 N1	2	
13.	(a) $\frac{1}{2}(6)(10)\sin\angle ACB = 22$ $\angle ACB = 47.17$ $\angle ACB = 132.83^o$	K1 N1	2	10
	(b) $(BA)^2 = 6^2 + 10^2 - 2(6)(10)\cos *132.83^o$ = 14.75	K1 N1	2	
	(c) $\frac{\sin\angle BCD}{8} = \frac{\sin 40}{6}$ $\angle BCD = 58.99^o$ $\angle BCD = 121.01^o\,(obtuse)$	K1	4	
	$\angle DBC = 180 - 121.01 - 40 = 18.99$	K1		
	$\frac{\sin\angle CBA}{10} = \frac{\sin 132.83}{*14.75}$ $\angle CBA = 29.82^o$ $\angle DBA = 18.99^o + 29.82^o$ $= 48.81^o$	K1 N1		
	(d) Area = $\frac{1}{2}(8)(14.75)\sin 48.81^o$ = 44.40 cm^2	K1 N1	2	
14.	Rujuk Lampiran			10

15.	(a) $t = 3$	P1	3	10
	$v = 6t - t^2 + c$	K1		
	$v = 6t - t^2 - 8$			
	V max = 1	N1		
	(b) $6t - t^2 - 8 = 0$	K1	3	
	$(t - 2)(t - 4) = 0$	K1		
	$t = 2, t = 4$	N1		
	(c) $s = 3t - \frac{t^3}{3} - 8t + c$	K1	4	
	$s_2 = 3(2)^2 - \frac{(2)^3}{3} - 8(2)$ OR $s_3 = 3(3)^2 - \frac{(3)^3}{3} - 8(3)$	K1		
	$\lvert s_2 \rvert + \lvert s_2 - s_3 \rvert$	K1		
	$\frac{22}{3}$	N1		



(a) I. $x + y \leq 80$ N1

II. $y - x \geq 5$ N1

III. $80x + 40y \geq 3200$ N1

(b) **Refer to the graph,**

1 graph correct
3 graphs correct K1 N1

Correct area N1

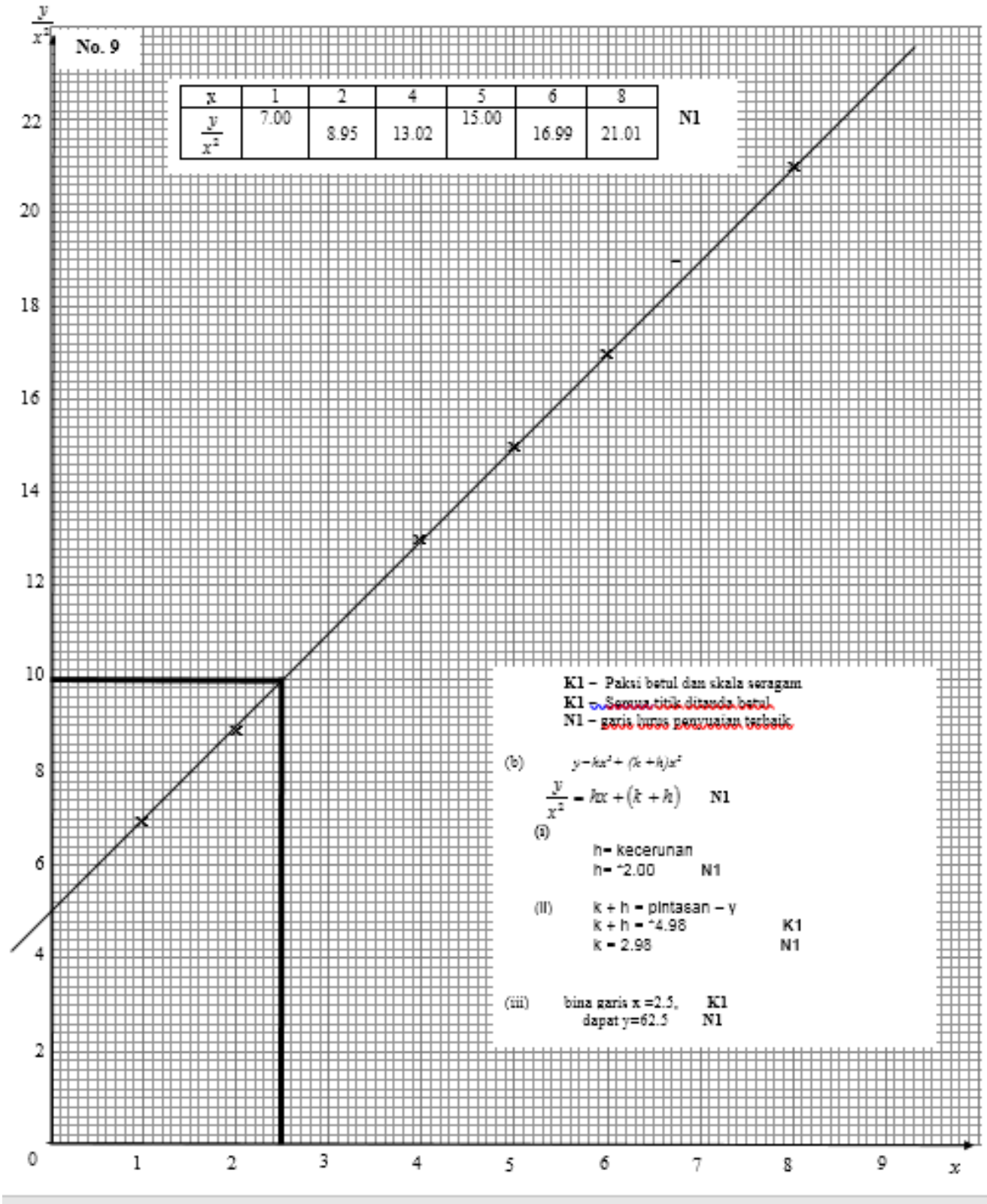
(c) (i) 30 N1

(ii) max point (37 , 42) N1

$k = 80(x) + 40(y)$

Max fees $= 80(42) + 40(37)$ K1

$= \text{RM } 4,840$ N1



x	1	2	4	5	6	8
$\frac{y}{x^2}$	7.00	8.95	13.02	15.00	16.99	21.01

N1

K1 – Paksi betul dan skala seragam
K1 – Semua titik ditanda betul
N1 – garis lurus penyuaian terbaik

(b) $y = kx^2 + (k+h)x^2$

$\frac{y}{x^2} = hx + (k+h)$ **N1**

(i)

h= kecerunan
h= ^2.00 **N1**

(ii) k + h = pintasan – y
k + h = ^4.98 **K1**
k = 2.98 **N1**

(iii) bina garis x =2.5, **K1**
dapat y=62.5 **N1**