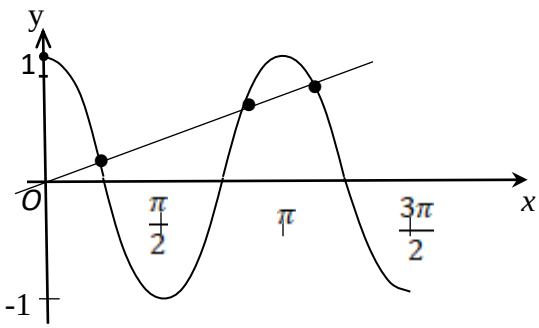
SKEMA PERMARKAH MATEMATIK TAMBAHAN KERTAS 2
PEPERIKSAAN PERCUBAAN SPM 2021

Bil	Peraturan Pemarkahan		Jumlah
1	(*a*) $\frac{dy}{dx} = 3(5-2x)^4 - 24x(5-2x)^3$	**K1**	**6**
	$\frac{dy}{dx} = 15(1-2x)(5-2x)^3$	**N1**	
	-45	**N1**	
	(*b*) $Q(2,6)$ atau cerun normal = $\frac{1}{45}$	**P1**	
	$6 = \frac{1}{45}(2) + c$	**K1**	
	$y = \frac{x}{45} + \frac{268}{45}$ *or equivalent*	**N1**	
2	(*a*) $\left(x - \frac{4k}{2}\right)^2 + 5k^2 + 1 - \frac{(-4k)^2}{4}$ **atau setara**	**K1**	**6**
	panduan : $(x-2k)^2 + k^2 + 1$		
	$k^2 + 1 = h^2 + 2k$	**K1**	
	$h^2 = (k-1)^2$ **dan** $h = k-1$	**N1**	
	(*b*) $x = 2k$ *dan* $2k = h-1$	**K1**	
	$k = -2$	**N1**	
	$h = -3$	**N1**	

Bil	Peraturan Pemarkahan	Jumlah
3	$\frac{x}{1-\frac{1}{2}} = \frac{y}{1-\frac{1}{3}}$ **K1** $4x = 3y$ **N1** $x\left(\frac{1}{2}\right)^3 - y\left(\frac{1}{3}\right)^3 = \frac{49}{36}$ **K1** Selesaikan $\frac{x}{8} - \frac{y}{27} = \frac{49}{36}$ dengan $4x = 3y$ **K1** $x = 18$ **N1** $y = 24$ **N1** beza = 6 **N1**	**7**
4	(*a*) $(8.6)^2 = (5.8)^2 + (5.8)^2 - 2(5.8)(5.8)kos\angle APB$ atau $(8.6)^2 = (7)^2 + (7)^2 - 2(7)(7)kos\angle AOB$ atau **setara** **K1** $\angle APB = 95.7°$ atau $\angle AOB = 75.8°$ **N1** $\angle APB = 1.670$ dan $\angle AOB = 1.323$ **N1** (*b*) C**ari luas sektor ADB atau sektor ACB** **K1** Panduan : $\frac{1}{2}(5.8)^2(4.614)$ atau $\frac{1}{2}(7)^2(4.961)$ **cari luas segitiga APB atau luas segitiga AOB** **K1** Panduan : $\frac{1}{2}(5.8)^2 \sin 95.7°$ atau $\frac{1}{2}(7)^2 \sin 75.8°$ **Cari luas tembereng major ADB atau tembereng major ACB** **K1** $\frac{1}{2}(5.8)^2(4.614 + \sin 95.7°)$ atau $\frac{1}{2}(7)^2(4.961 + \sin 75.8°)$ $\frac{1}{2}(7)^2(4.961 + \sin 75.8°) - \frac{1}{2}(5.8)^2(4.614 + \sin 95.7°)$ **K1 menolak** 50.95 **N1**	**8**

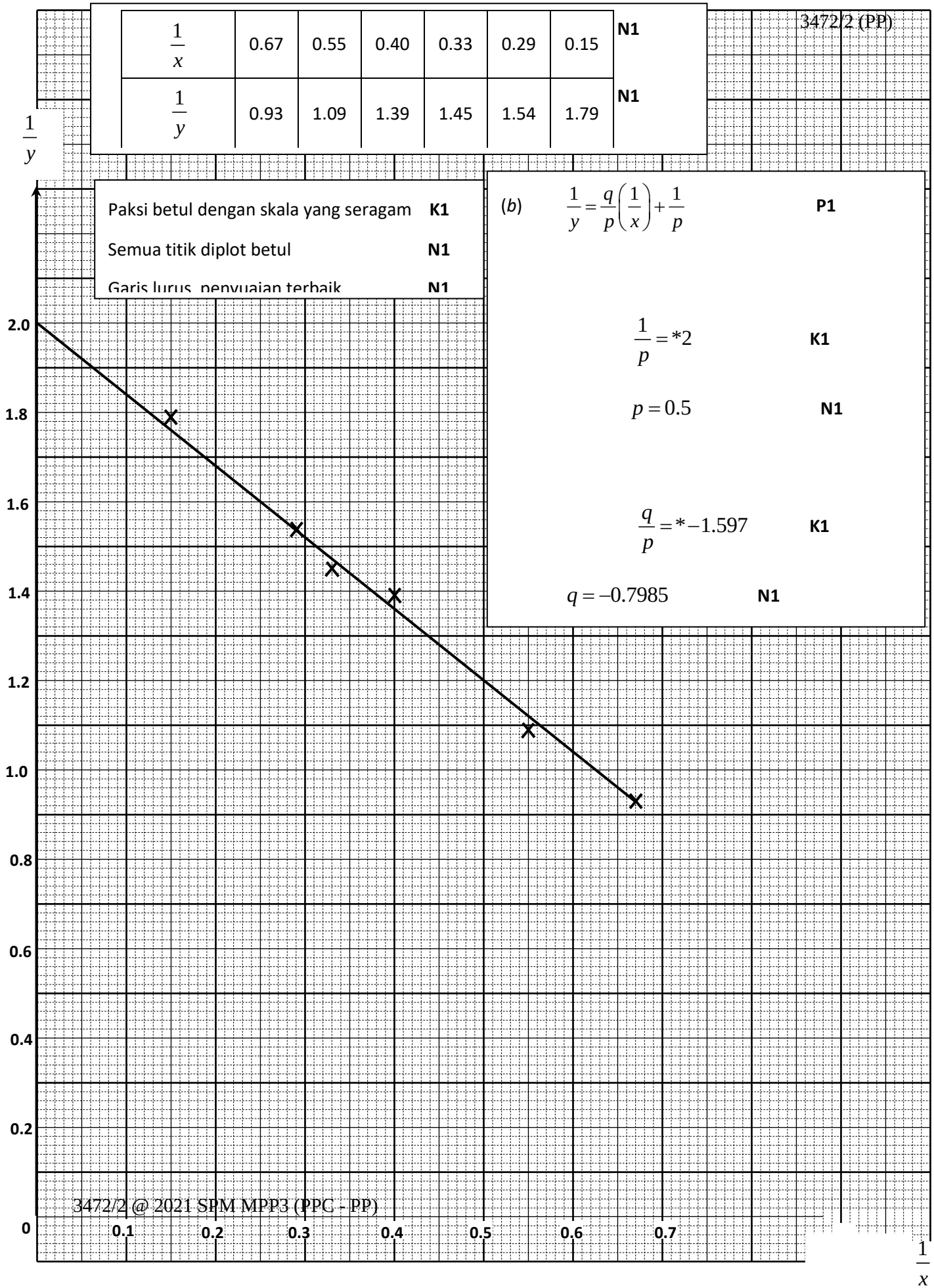
Bil	Peraturan Pemarkahan	Jumlah
5	(*a*) $\overrightarrow{PR} = \overrightarrow{PS} + \overrightarrow{SR}$ **K1 guna hukum segitiga untuk mencari** $\overrightarrow{PR}$ **atau** $\overrightarrow{TS}$ $= 20\underset{\sim}{x} - 24\underset{\sim}{y}$ **N1** $\overrightarrow{TS} = \overrightarrow{TP} + \overrightarrow{PS}$ $\overrightarrow{TS} = \frac{1}{4}\left(-20\underset{\sim}{x} + 24\underset{\sim}{y}\right) + 20\underset{\sim}{x}$ $= 15\underset{\sim}{x} + 6\underset{\sim}{y}$ **N1** (*b*) $\overrightarrow{QR} = \overrightarrow{QP} + \overrightarrow{PR}$ $= \frac{4}{3}(24\underset{\sim}{y}) + 20\underset{\sim}{x} - 24\underset{\sim}{y}$ **K1** $= 8\underset{\sim}{y} + 20\underset{\sim}{x}$ **N1** $\overrightarrow{TS} = \lambda\overrightarrow{QR}$ **P1** $15\underset{\sim}{x} + 6\underset{\sim}{y} = \lambda\left(8\underset{\sim}{y} + 20\underset{\sim}{x}\right)$ **dan** $20\lambda = 15$ atau $8\lambda = 6$ K1 $\overrightarrow{TS} = \frac{3}{4}\overrightarrow{QR}$ atau setara **N1**	**8**

Bil	Peraturan Pemarkahan	Jumlah
6	(*a*) LHS = $\dfrac{1-\tan^2 x}{\sec^2 x}$ **K1 guna 1 + tan²x = sec²x** $= \left(1-\dfrac{\sin^2 x}{\cos^2 x}\right) kos^2 x$ $= kos^2x - sin^2x$ **N1 (LHS = RHS)** (*b*)  Shape of cosine graph **P1** Amplitude =1 **P1** $1\frac{1}{2}$ cycle for $0 \le x \le \frac{3}{2}\pi$ **P1** (*c*) $y = \frac{x}{5\pi}$ **K1** Lakar garis lurus samada kecerunan atau pintasan-y betul **K1** Bil penyelesaian = 3 **N1**	**8**

Bil	Peraturan Pemarkahan		Jumlah
7	(*a*) $\frac{3-m}{3-8}=3$	**K1**	**7**
	$m = 18$	**N1**	
	(*b*) $kh(x)=\frac{4\left(\frac{3x}{x-4}\right)}{\left(\frac{3x}{x-4}\right)-3}$	**K1**	
	$= x$	**N1**	
	cari $hk(x)=\frac{3\left(\frac{4x}{x-3}\right)}{\left(\frac{4x}{x-3}\right)-4}$	**K1**	
	= x		
	$kh(x) = hk(x) = x$	**K1**	
	$k(x)$ adalah fungsi songsang bagi $h(x)$ atau sebaliknya	**N1**	

Bil	Peraturan Pemarkahan	Jumlah
8	(a) cerun $DG = 4$ **P1** $y-7=4(x-1)$ atau setara **K1** $4x-y+3=0$ **N1** (b) (i) $\frac{6-n}{5-m}=4$ **K1** $4m-n=14$ atau setara **N1** (ii) $\frac{1}{2}\begin{vmatrix}1 & 5 & m & 1\\ 7 & 6 & n & 7\end{vmatrix}$ $\frac{1}{2}\left\lvert(6+5n+7m)-(35+6m+n)\right\rvert$ **K1** $Luas=\frac{1}{2}\left\lvert-29+m+4n\right\rvert$ atau $Luas=\frac{1}{2}\left\lvert29-m-4n\right\rvert$ **N1** Menyelesaikan persamaan serentak **K1** $4m-n=14$ dan $\frac{29-m-4n}{2}=34$ $m=1$, $n=-10$ **N1 N1**	**10**

$\frac{1}{x}$	0.67	0.55	0.40	0.33	0.29	0.15	**N1**
$\frac{1}{y}$	0.93	1.09	1.39	1.45	1.54	1.79	**N1**



Paksi betul dengan skala yang seragam **K1**

Semua titik diplot betul **N1**

Garis lurus penyuaian terbaik **N1**

(*b*) $\frac{1}{y}=\frac{q}{p}\left(\frac{1}{x}\right)+\frac{1}{p}$ **P1**

$\frac{1}{p}=*2$ **K1**

$p=0.5$ **N1**

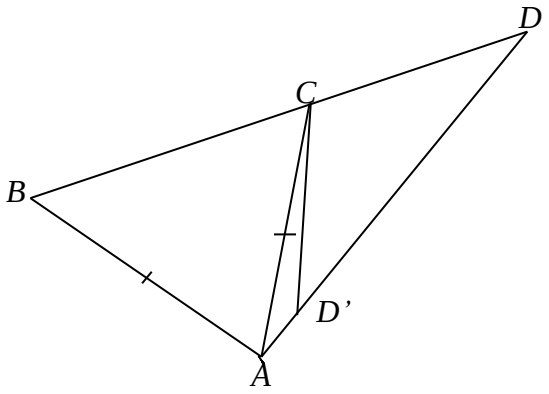
$\frac{q}{p}=*-1.597$ **K1**

$q=-0.7985$ **N1**

Bil	Peraturan Pemarkahan	Jumlah
10	(*a*) $k - 6(1) = 0$ **K1** $k = 6$ **N1** (b) $\frac{dy}{dx} = 6 - 6x$ $y = \int (6 - 6x)dx$ $y = 6x - \frac{6x^2}{2} + c$ **K1** $c = 0$ $y = 6x - 3x^2$ **N1** (c) $A = \int_0^2 (6x - 3x^2)\,\mathrm{dx}$ $= \left[\frac{6x^2}{2} - \frac{3x^3}{3} \right]_0^2$ **K1** $= 3(2)^2 - (2)^3$ $= 4$ **N1** (d) $V = \pi(3)^2(1) - \pi\int_0^1 \left(6x - 3x^2\right)^2 dx$ $= 9\pi - \pi\left[\frac{36x^3}{3} - \frac{36x^4}{4} + 9x^5 \right]_0^1$ **K1** (kamir untuk cari isipadu /silinder) **K1** (menolak kamiran yang sah) $= 9\pi - \pi\left[\frac{36(1)^3}{3} - \frac{36(1)^4}{4} + 9(1)^5 \right]_0^1$ **K1** (mengganti limit) $= \frac{21}{5}\pi$ **N1**	**10**

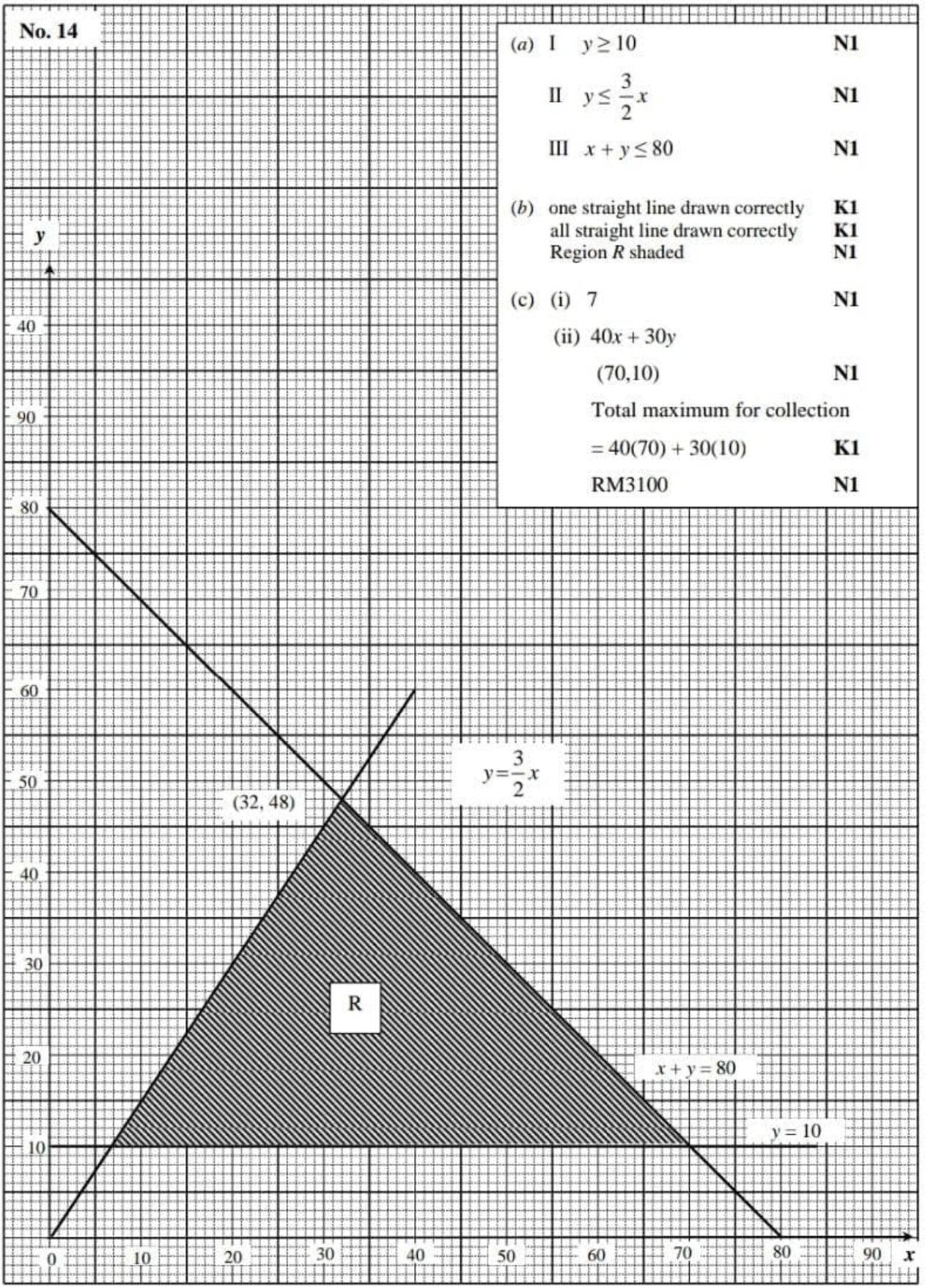
Bil	Peraturan Pemarkahan		Jumlah
11	(a) (i) $n(0.8) = 300$	**K1**	**10**
	$n = 375$	**N1**	
	(ii) P(X = 0) + P(X = 1) + P(X = 2)	**P1**	
	$8C_0\,(0.8)^0(0.2)^8 + 8C_1\,(0.8)^1(0.2)^7 + 8C_2\,(0.8)^2(0.2)^6$	**K1**	
	$= 0.001231$	**N1**	
	(b) (i) P(58 < x < 67)		
	$P\left(\frac{58-63}{11} < z < \frac{67-63}{11}\right)$	**K1**	
	$= 0.3172$	**N1**	
	(ii) P(x > m) = 0.987		
	$P\left(z > \frac{m-63}{11}\right) = 0.987$		
	2.225 dilihat	**P1**	
	$\frac{m-63}{11} = -2.225$	**K1**	
	$m = 38.53$	**N1**	

Bil	Peraturan Pemarkahan		Jumlah
12	(*a*) $\sum W = 40 + x + 40 + 30 + x$	**P1**	**10**
	$\frac{(140 \times 40) + (120 \times x)(125 \times 40) + (115 \times 30) + (130 \times x)}{40 + x + 40 + 30 + x} = 127$	**K1**	
	20	**N1**	
	(*b*) $\frac{40}{Q_{16}} \times 100 = 127$	**K1**	
	RM 31.50	**N1**	
	(*c*) $\frac{125}{100} \times \frac{125}{100} \times 100$ **ATAU** $\frac{125 \times 125}{100}$	**K1**	
	156.25	**N1**	
	(*d*) 70 atau setara	**P1**	
	$\frac{70}{100} \times 127$ atau setara	**K1**	
	88.89	**N1**	

Bil	Peraturan Pemarkahan				Jumlah
13	(a)	(i)	$18^2 = 12^2 + 20^2 - 2(12)(20)\text{Cos} \angle ABD$	**K1**	**10**
			62.72^o	**N1**	
		(ii)	BC = $2(12 \cos 62.72^o)$	**K1**	
			11.00	**N1**	
		(iii)	Area ABC = $\frac{1}{2}(12)(11)\sin 62.72^o$	**K1**	
			58.66	**N1**	
	(b)	(i)	 **N1**(tanda $D`$ dan $\angle CD`A$ cakah)		
		(ii)	$\frac{\sin C`A`D`}{9} = \frac{\sin 117.28°}{18}$	**K1**	
			$\angle C`A`D` = 26.38°$	**N1**	
			$\angle A`D`C` = 143.66°$	**N1**	

No. 14

(*a*)	I $y \geq 10$	**N1**
	II $y \leq \frac{3}{2}x$	**N1**
	III $x + y \leq 80$	**N1**
(*b*)	one straight line drawn correctly	**K1**
	all straight line drawn correctly	**K1**
	Region *R* shaded	**N1**
(c)	(i) 7	**N1**
	(ii) $40x + 30y$	
	(70,10)	**N1**
	Total maximum for collection	
	$= 40(70) + 30(10)$	**K1**
	RM3100	**N1**



Bil	Peraturan Pemarkahan		Jumlah
15	(*a*) $s = t^3 - 6t + 9t$		**10**
	$\frac{ds}{dt} = 3t^2 - 12t + 9$	**K1**	
	t = 0, v = $3(0)^2 - 12(0) + 9$		
	= 9 ms^{-1}	**N1**	
	(*b*) $3t^2 - 12t + 9 = 0$		
	$t^2 - 4t + 3 = 0$		
	$(t - 1)(t - 3) = 0$	**K1**	
	$t = 1$, $t = 3$	**N1**	
	(*c*) $a = \frac{dv}{dt} = 6t - 12$		
	$a = 0$	**K1**	
	$6t - 12 = 0$		
	$t = 2$	**N1**	
	v = $3(2)^2 - 12(2) + 9$		
	= -3 ms^{-1}	**N1**	
	(*d*) $6t - 12 < 0$		
	$0 < t < 2$	**K1**	
	$s_{t=1} + s_{t=2}$		
	= $(1)^3 - 6(1)^2 + 9(1) + 2^3 - 6(2)^2 + 9(2)$	**K1**	
	= 4 + 2		
	= 6	**N1**	