



**MODUL TOPIKAL  
SOALAN PERCUBAAN SPM 2023**

**TOPIK TINGKATAN 4  
BAB 6**

**HUKUM LINEAR  
(*LINEAR LAW*)**

**SUMBER SOALAN:  
SOALAN – SOALAN PERCUBAAN**

TERENGGANU  
NEGERI SEMBILAN  
KELANTAN  
SABAH  
SBP  
MELAKA  
SELANGOR (MODUL PINTAS-SET 1)  
PERAK

**SKEMA JAWAPAN**

**DISUSUN OLEH:**  
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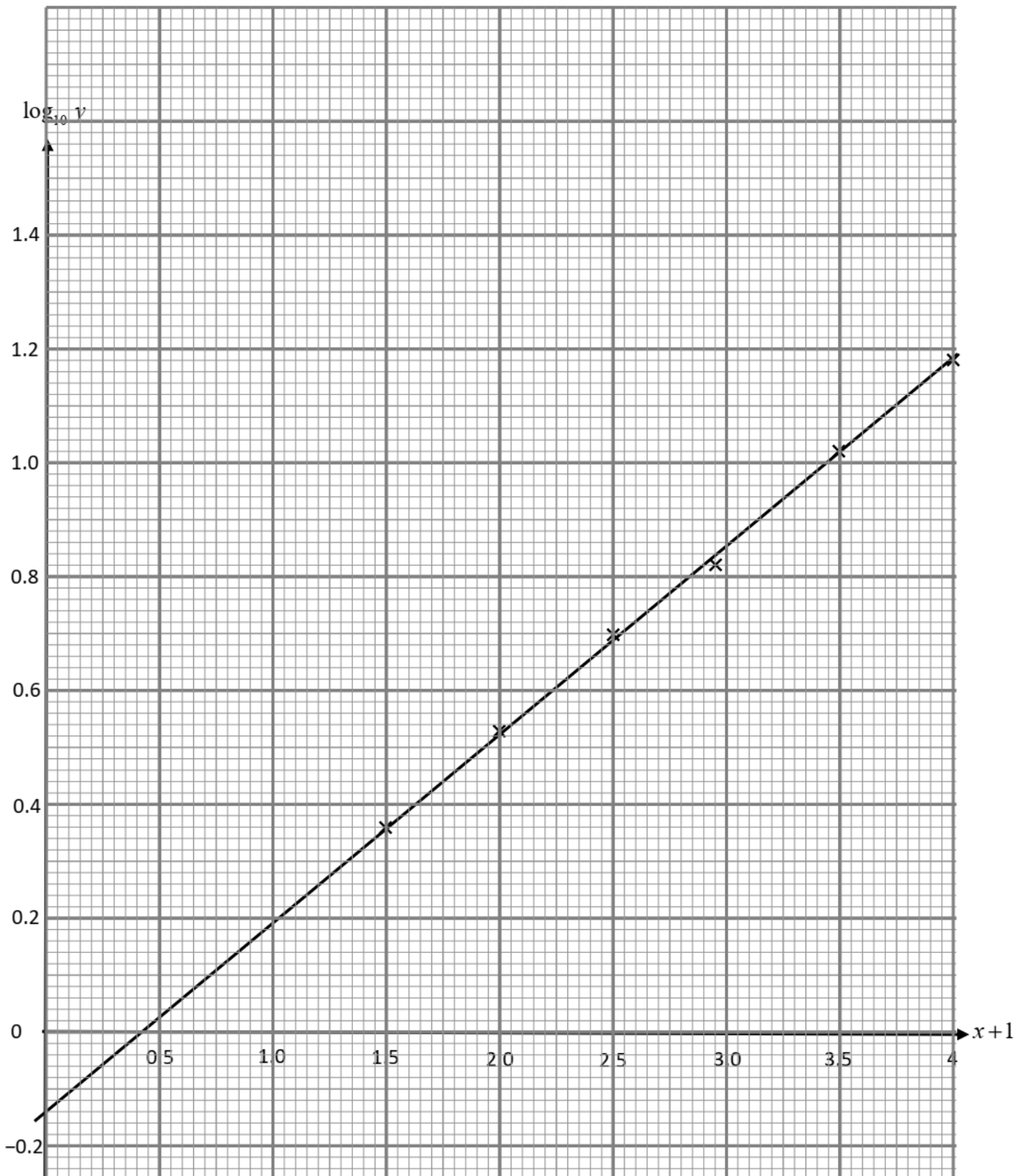
**SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI TERENGGANU 2023 (KERTAS 1)**

<b>6</b>	$\frac{1}{y} = \frac{k}{h} + \frac{3}{h} \left( \frac{1}{x} \right)$	<b>P1</b>	
	$\frac{3}{h} = \frac{4}{5}$	<b>K1</b>	
	$\frac{h(4)}{k(4)+3} = 1$	<b>K1</b>	<b>4</b>
	$h = \frac{15}{4} \text{ dan } k = 3$	<b>N1</b>	

**SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI TERENGGANU 2023 (KERTAS 2)**

<b>8</b>	<p><b>(a)</b></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 5px;"><math>x+1</math></td> <td style="padding: 5px;">1.5</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">2.5</td> <td style="padding: 5px;">2.95</td> <td style="padding: 5px;">3.5</td> <td style="padding: 5px;">4</td> </tr> <tr> <td style="padding: 5px;"><math>\log_{10} y</math></td> <td style="padding: 5px;">0.36</td> <td style="padding: 5px;">0.53</td> <td style="padding: 5px;">0.70</td> <td style="padding: 5px;">0.82</td> <td style="padding: 5px;">1.02</td> <td style="padding: 5px;">1.18</td> </tr> </table> <p style="margin-top: 10px;">Paksi betul dan skala seragam bagi garis lurus <b>K1</b></p> <p>Semua titik diplot betul <b>N1</b></p> <p>garis lurus penyuaian terbaik <b>N1</b></p>	$x+1$	1.5	2	2.5	2.95	3.5	4	$\log_{10} y$	0.36	0.53	0.70	0.82	1.02	1.18		<b>10</b>
$x+1$	1.5	2	2.5	2.95	3.5	4											
$\log_{10} y$	0.36	0.53	0.70	0.82	1.02	1.18											
	<p><b>(b)</b></p> <p>(i) <math>y = 2.754</math> <b>N1</b></p> <p>(ii) <math>\log_{10} y = (x+1)\log_{10} p - \log_{10} q</math> <b>P1</b></p> <p style="margin-left: 20px;"><math>*0.328 = \log_{10} p \quad \&amp; \quad -\log_{10} q = * -0.14</math> <b>K1</b></p> <p style="margin-left: 20px;"><math>p = 2.128</math> <b>N1</b></p> <p style="margin-left: 20px;"><math>q = 1.380</math> <b>N1</b></p>																

No. 8



SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 1)

3	(a)	$\frac{4 - (-2)}{2 - 6}$	K1
		$xy = -\frac{3}{2}x^2 + 7$	K1
		$y = -\frac{3}{2}x + \frac{7}{x}$	N1
	(b)	$X = \frac{1}{x}, Y = \frac{y}{x^2}$	N1N1

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 2)

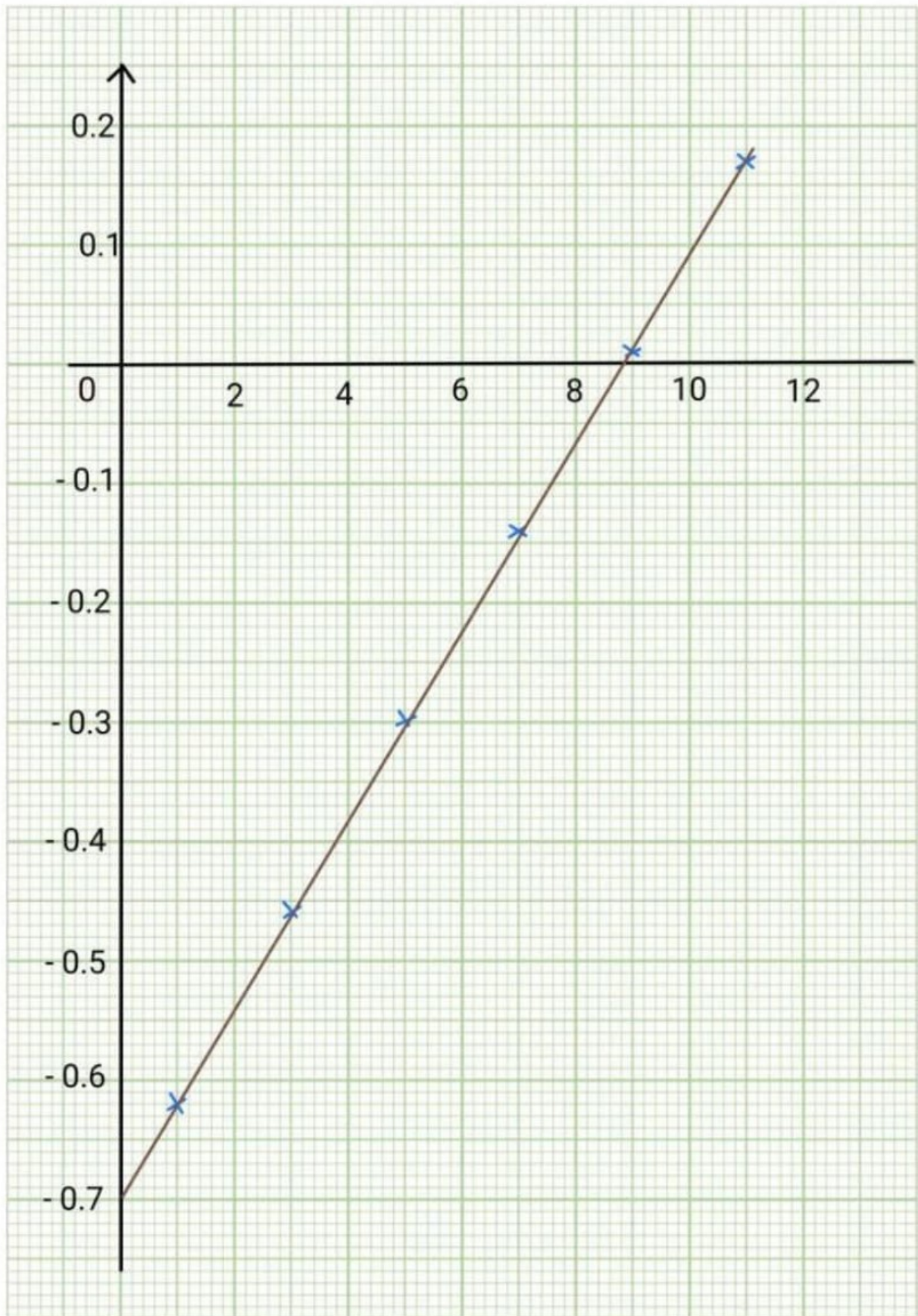
8(a)	Lihat lampiran muka surat 10	
(b)(i)	$\log_{10} y = (x - 1) \log_{10} q + \log_{10} p$	P1
	$\log_{10} p = *c$ atau $\log_{10} q = *m$ (Nota: $*c$ ialah pintasan-y grafnya dan $*m$ ialah kecerunan grafnya)	K1
	$p = 6.166$ (terima $6.0954 < p < 6.2373$ )	N1
	$q = 0.4553$ (terima $0.4571 < q < 0.4677$ )	N1
(b)(ii)	1.2882	N1

**SOALAN 5 : SOALAN PERCUBAAN SPM NEGERI KELANTAN 2023 (KERTAS 1)**

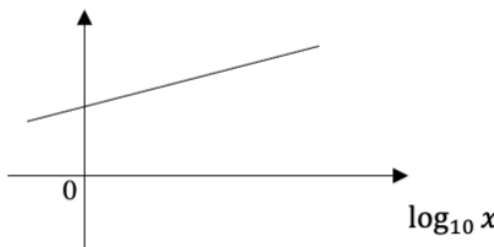
1	$0 = 2(-5)^2 + k(-5)$	K1	5
	$k = 10$	N1	
	$\frac{y}{x} = 2x + k$	K1	
	$-6 = 2p + 10$ or $q = 2(-2) + 10$	K1	
	$p = -8$ dan $q = 6$	N1	

**SOALAN 6 : SOALAN PERCUBAAN SPM NEGERI KELANTAN 2023 (KERTAS 2)**

9	$2x - 1$	1	3	5	7	9	11	N1	10
(a)	$\log_{10} y$	-0.62	-0.46	-0.30	-0.14	0.01	0.17	N1	
	plot $\log_{10} y$ melawan $(2x + 1)$							K1	
	<ul style="list-style-type: none"> <li>• paksi-paksi betul dan skla seragam</li> <li>• sekurang-kurangnya satu titik di plot betul</li> </ul>								
(b)	6 titik di plot betul							N1	
	garis penyuaian terbaik							N1	
(c)	$\log_{10} y = \log_{10} s(2x - 1) + \log_{10} r$							P1	
	$\log_{10} r = -0.7$ atau $\log_{10} s = \frac{0.2 - (-0.7)}{11.4 - 0}$							K1	
	$r = 0.1995$							N1	
	$s = 1.199$							N1	
	$\log_{10} y = -0.38$							N1	



**SOALAN 7 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 1)**

<p><b>6</b></p>	<p>a) <math>y = pq^x</math>  <math>\log_{10} y = \log_{10} p + \log_{10} q^x</math>  <math>\log_{10} y = \log_{10} q (x) + \log_{10} p</math>  <math>\log_{10} q = -\frac{3}{7}</math> or <math>\log_{10} p = 3</math>  <math>q = 0.3728</math> and <math>p = 1000</math></p>	<p>P1 K1 N1</p>	
	<p>b)                  Lukiskan graf <math>\log_{10} y</math> kepada <math>\log_{10} x</math>  <math>\log_{10} y = \log_{10} x (b) + \log_{10} a</math>  <math>\log_{10} a =</math> penggal pada paksi-<math>\log y</math>  <math>b =</math> kecerunan garis lurus itu                  atau  <math>\log_{10} y</math></p>  <p style="text-align: right;"><math>\log_{10} x</math></p>	<p>N1</p>	<p><b>4</b></p>

**SOALAN 8 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 2)**

<b>11</b>	$H$	30	60	90	120	150	180	N1	
	$x^2H$	14	26	34	46	54	66		
a)								K1	<b>10</b>
	<p>Paksi dilukis dengan betul dan skala seragam, sekurang-kurangnya 1 titik plot betul dengan menggunakan data yang diberi dalam soalan saja.</p>							N1	
	<p>6 titik diplot dengan betul</p> <p>Garis lurus penyuaian terbaik, sekurang-kurangnya 5 titik diplot betul</p>							N1	
	<p>b) <math>x^2H = \frac{a}{2}H + \frac{b}{2}</math></p> <p><math>m = \frac{a}{2}, \quad c = \frac{b}{2}</math></p> <p>Dari graf;</p> <p><math>\frac{a}{2} = 0.25 \quad \frac{b}{2} = 5</math></p> <p><math>a = 0.5 \quad b = 10</math></p>							P1	K1
								N1	N1
	<p>c) Dari graf;</p> <p><math>x^2H = 20</math></p> <p><math>x = 0.6667</math></p>							N1	
	<p>d) <math>x = 0.5244</math>,</p> <p>guna rumus</p> <p><math>H = 200</math> jam</p> <p>Bilangan pekerja = <math>\frac{200}{10} = 20</math></p> <p>Jumlah bawaran = <math>20 \times \text{RM}100 = \text{RM}2000</math></p>							N1	N1



SOALAN 9 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 1)

1  $m = \frac{8-2}{3-6}$

K1

4

Selesaikan untuk c

$2 = -2(6) + c$  @ setara K1

$xy = -2(x + y) + 14$  @ setara K1

$y = \frac{14-2x}{2+x}$  N1

4

SOALAN 10 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 2)

8(a)

$\log_{10} x$	0.20	0.41	0.60	0.90	1.20	1.32	N1
$\log_{10} y$	0.15	0.30	0.43	0.59	0.80	0.90	N1

5

Paksi betul dan skala seragam bagi garis lurus      **K1**  
Semua titik diplot betul      **N1**  
Garis lurus penyuaiian terbaik      **N1**

(b)

$$\log_{10} y = -\frac{1}{r} \log_{10} x + \log_{10} s \quad \text{P1}$$

5

(i)

Guna  $*m = -\frac{1}{r}$

$$-\frac{1}{r} = \frac{0.80 - 0.30}{1.20 - 0.41} \quad \text{K1}$$

$$r = -1.58 \quad \text{N1}$$

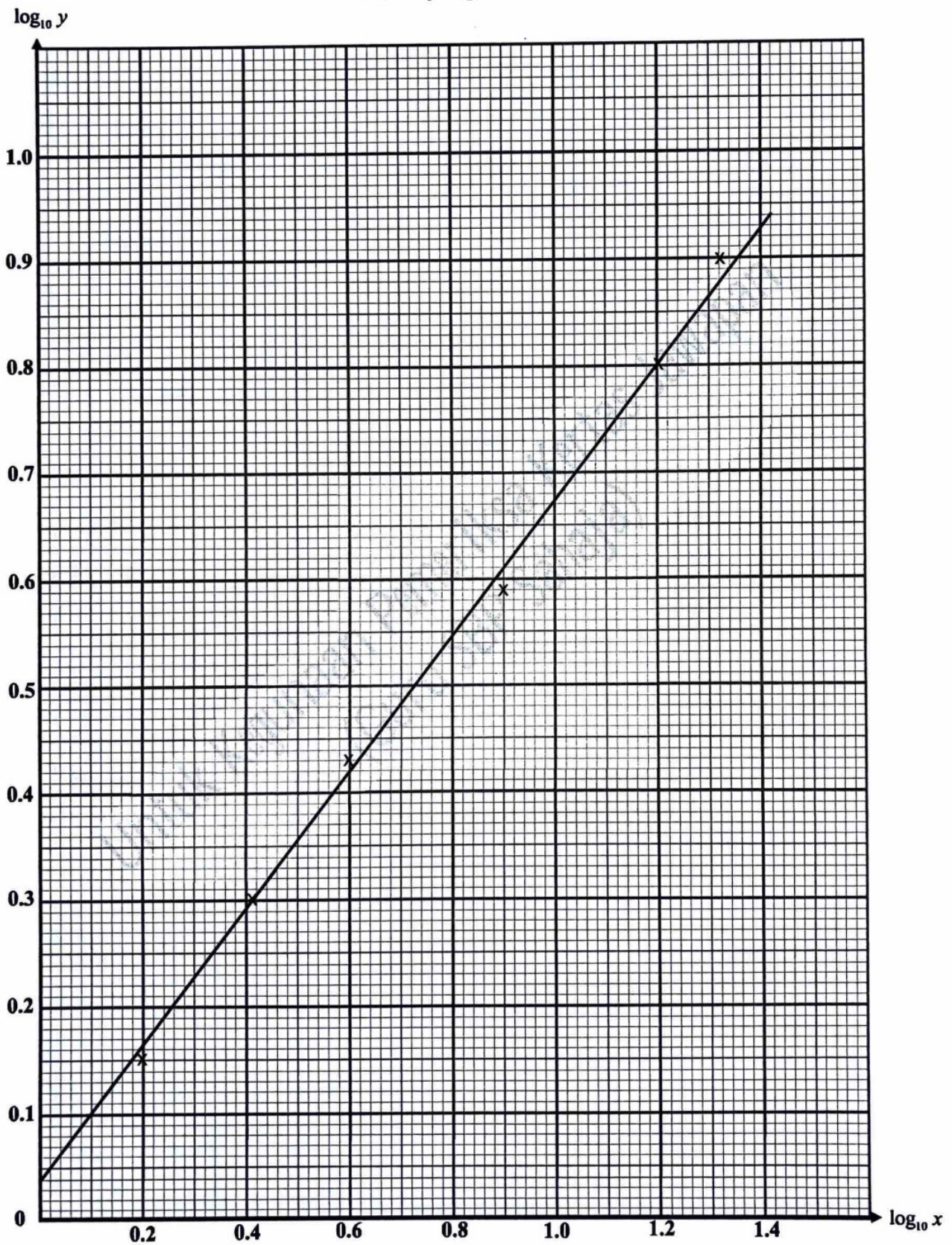
(ii)

Guna  $*c = \log_{10} s$

Syarat:  $0.03 \leq c \leq 0.04$

$$\log_{10} s = 0.04 \quad \text{K1}$$

$$s = 1.096 \quad \text{N1}$$



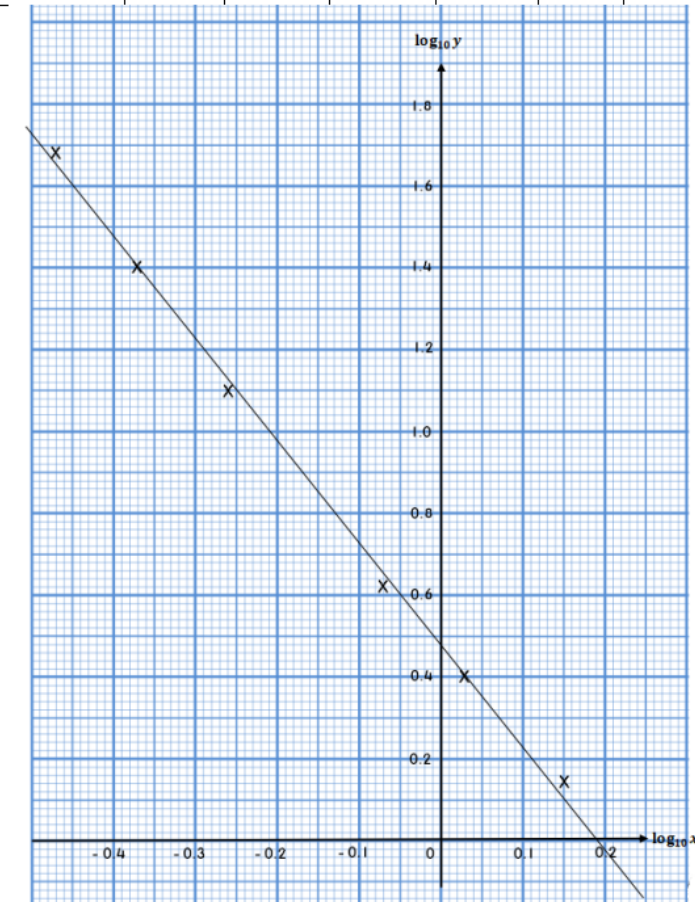
SOALAN 11 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 1)

8. (a)	$y = p\sqrt{x} - \frac{q}{x}$ $xy = p\sqrt{x^3} - q$	OR	$y = p\sqrt{x} - \frac{q}{x}$ $\frac{y}{\sqrt{x}} = p - \frac{q}{\sqrt{x^3}}$	1	
	Paksi-Y = $xy$ Paksi-X = $\sqrt{x^3}$	OR	Paksi-Y = $\frac{y}{\sqrt{x}}$ Paksi-X = $\frac{1}{\sqrt{x^3}}$	1	
(b) (i)	$\ln y = \frac{1}{4} \ln x + \frac{A}{4}$ $m = \frac{1}{4}$			1	
(ii)	$0.5 = \frac{A}{4}$ $A = 2$			1	
				1	6

SOALAN 12 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 2)

8 (a)

$\log_{10} x$	-0.47	-0.37	-0.26	-0.07	0.03	0.15
$\log_{10} y$	1.68	1.40	1.10	0.62	0.40	0.14



Skala uniform pada kedua-dua paksi dengan 1 titik diplot dengan betul.

Plot semua 6 titik dengan betul.

Graf garis lurus penyuaian terbaik

(b)

$$\log_{10} y = \left(-\frac{1}{q}\right) \log_{10} x + \log_{10} p$$

$$\log_{10} p = 0.48$$

$$p = 3.02$$

$$-\frac{1}{q} = \frac{1.4 - 0.4}{-0.37 - 0.03}$$

$$q = 0.40$$

1

1

10

1

1

1

1

1

1

1

1

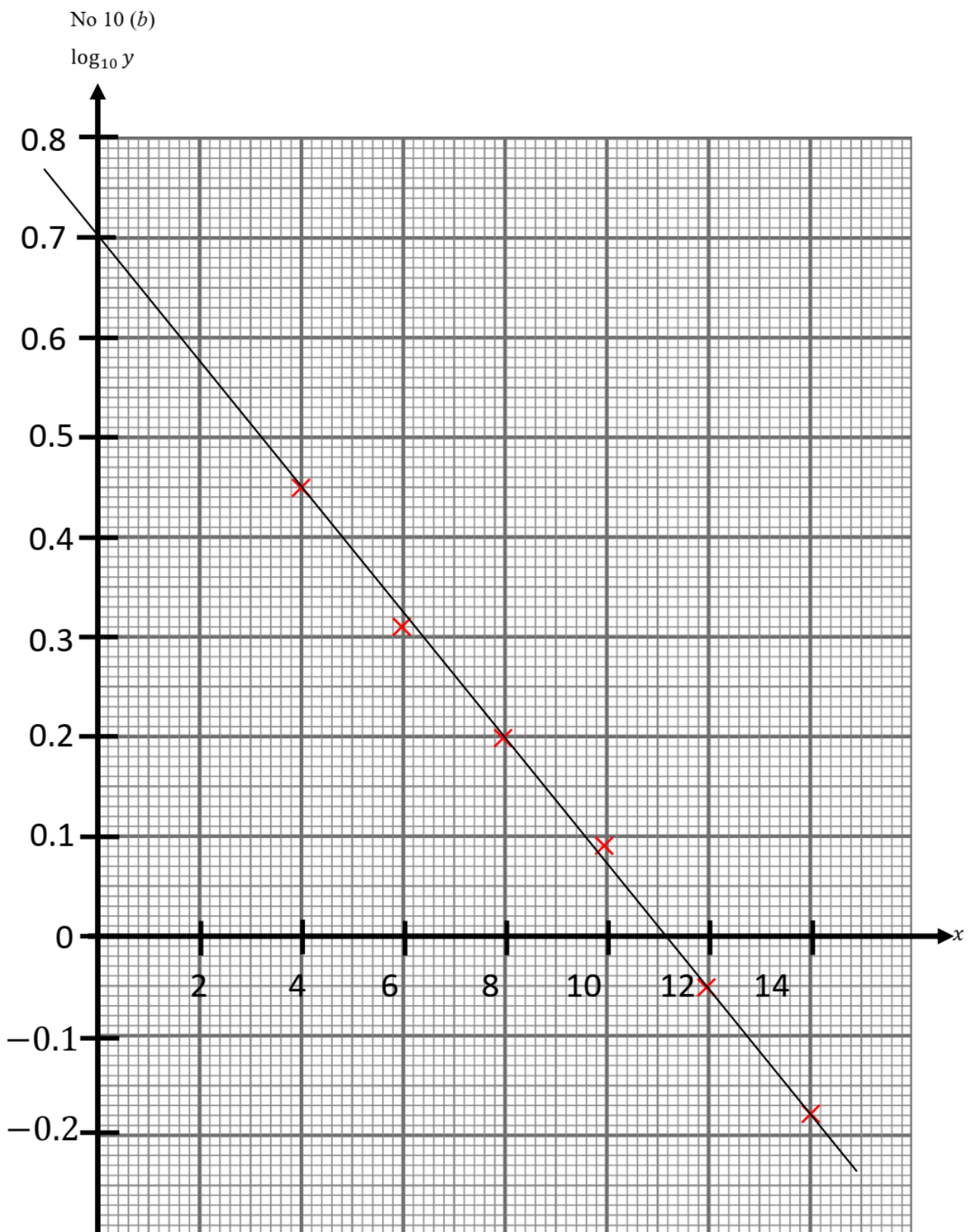
**SOALAN 13 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 2023 (KERTAS 1)**

8		$x^2y = -2x + p$	P1	4
		$p = 4$	N1	
		$\frac{y}{x} = \frac{p}{x^3} - 2$	P1	
		$q = -2$	N1	

**SOALAN 14 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 2023 (KERTAS 2)**

10	(a)	<table border="1"> <tr> <td>y</td> <td>2.82</td> <td>2.04</td> <td>1.58</td> <td>1.23</td> <td>0.89</td> <td>0.66</td> </tr> </table>	y	2.82	2.04	1.58	1.23	0.89	0.66	P1	
	y	2.82	2.04	1.58	1.23	0.89	0.66				
(b)	<p>Graf garis lurus <math>\log_{10} y</math> melawan <math>x</math> dilukis</p> <ul style="list-style-type: none"> <li>- Paksi-paksi betul dan skala seragam dari titik pertama hingga titik-titik terakhir</li> <li>- Sekurang-kurangnya satu titik diplot betul</li> </ul> <p>Garis lurus penyuuaian terbaik *6 titik diplot dengan betul</p>	K1 N1 N1									
(c)	<p><math>\log_{10} y = -x \log_{10} q + \log_{10} p</math></p> <p>Guna *<math>m = -\log_{10} q</math> @ Guna *<math>c = \log_{10} p</math></p> <p><math>q = 1.151</math></p> <p><math>p = 5.012</math></p> <p>Syarat: <math>0.65 \leq c \leq 0.75</math></p>	P1 K1 N1 N1									
(d)	<p><math>\log_{10} y = -\frac{29}{475}(20) + 0.7</math></p> <p><math>\log_{10} y = -0.5211</math></p> <p>Syarat: <math>-0.55 \leq c \leq -0.51</math></p>	K1 N1									

10



**SOALAN 15 : SOALAN PERCUBAAN SPM NEGERI PERAK 2023 (KERTAS 1)**

4	(a)	$m = -\frac{2}{4}$ atau $m = -\frac{2-0}{0-4}$	1	4
		$y = -\frac{1}{2}x + 2$	1	
(b)	$4 = -\frac{1}{2}x + 2$	1		
	$x = -4$	1		



**SOALAN 16 : SOALAN PERCUBAAN SPM NEGERI PERAK 2023 (KERTAS 2)**

9 (a)

$\log_{10} x$	0.18	0.30	0.48	0.60	0.70	0.78
$\log_{10} y$	0.93	0.78	0.69	0.54	0.49	0.36



1  
1  
  
1  
1  
1

10

(b) i 3.89 ↔ 4.07

ii  $\log_{10} y = a \log_{10} x + \log_{10} b$

$a = * \text{kecerunan} // (-0.889)$

$\log_{10} b = * \text{pintasan} - \text{logy} // 1.08$

$b = 11.75 \leftrightarrow 12.30$

1  
1  
1  
1  
1