MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2022

TOPIK TINGKATAN 4

BAB 6

HUKUM LINEAR
(*LINEAR LAW*)

SUMBER SOALAN:

SOALAN – SOALAN PERCUBAAN

NEGERI SEMBILAN
SELANGOR SET A (MODUL PINTAS)
MELAKA
JOHOR (TANGKAK)
JOHOR (MUAR)
TERENGGANU
PUTRAJAYA

SKEMA JAWAPAN

DISUSUN OLEH:

PN. NOORUL HUDA BINTI MOHD HASHIM
(SMK TAMAN TASIK, TAIPING)

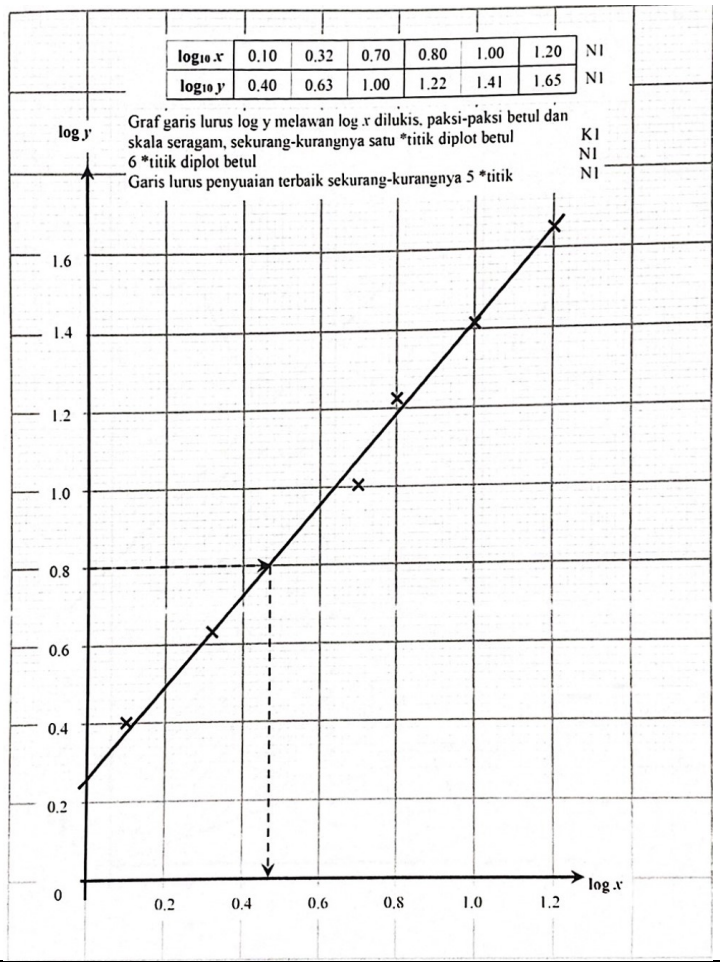
PN ZAINAB BINTI ABD RAHMAN
(SMK CONVENT, TAIPING)

SOALAN 1 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2022 (KERTAS 1)

2	$\frac{3-(-3)}{1-2}$ atau $3 = -6(1) + c$	K1
	$y^2 - x^2 = -6x + 9$	K1
	$y = x - 3$ dan $y = -x + 3$	N1
		3 markah

SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2022 (KERTAS 2)

9	(a)	Lihat lampiran m/s 9	5 m
	(b) (i)	$\log_{10} y = \log_{10} h + (k-2)\log_{10} x$	P1
		$k - 2 = \frac{1.65-0.63}{1.20-0.32} = 1.159$ (terima $1.147 \le m \le 1.20$) atau $\log_{10} h = 0.26$	K1
		$k = 3.159$	N1
	(ii)	$h = 1.820$	N1
	(iii)	$x = 2.951$	N1
			10 markah



$\log_{10} x$	0.10	0.32	0.70	0.80	1.00	1.20	N1
$\log_{10} y$	0.40	0.63	1.00	1.22	1.41	1.65	N1

Graf garis lurus log y melawan log x dilukis. paksi-paksi betul dan skala seragam, sekurang-kurangnya satu *titik diplot betul — K1
6 *titik diplot betul — N1
Garis lurus penyuaian terbaik sekurang-kurangnya 5 *titik — N1

SOALAN 3 : SOALAN PERCUBAAN NEGERI SELANGOR K1 (MODUL PINTAS SET A)

7.

(a) $\left[2y = (m-1)x + \frac{10}{x}\right]\frac{x}{2}$

$xy = \frac{(m-1)x^2}{2} + 5$ — N1 — 1

(b) $\frac{m-1}{2} = -3$ atau $5n = 5$ — K1

$m = -5$ — N1

$n = 1$ — N1 — 3

4

SOALAN 4 : SOALAN PERCUBAAN NEGERI SELANGOR K2 (MODUL PINTAS SET A)

9 (a)

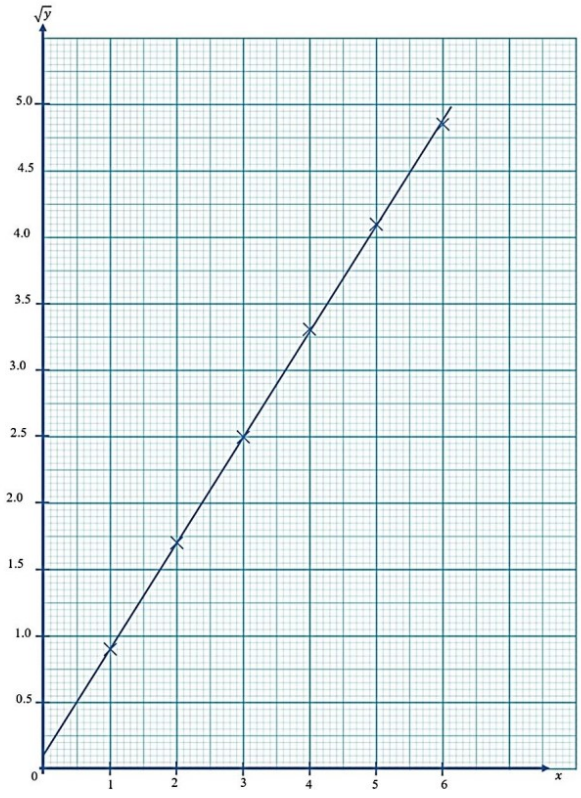
$\sqrt{y}$	0.91	1.69	2.5	3.3	4.1	4.85

N1

Plot paksi-$\sqrt{y}$ melawan paksi-x dengan skala seragam yang betul dan satu titik diplot dengan betul. — K1

Keenam-enam titik diplot dengan betul. — N1

Garis lurus penyuaian terbaik. — N1



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(b) (i) $\sqrt{y} = \frac{4}{p}x - \frac{4q}{p}$ — P1

$\frac{4}{p} = \frac{4.1^* - 0.1^*}{5^* - 0^*}$ * bagi mana-mana dua pasangan titik di atas garis lurus penyuaian terbaik — K1

$p = 5 \sim 5.11$ — N1

$-\frac{4q}{p} = 0.10^*$ * merujuk pintasan-y dalam graf — K1

$q = -0.19 \sim -0.13$ — N1

(ii) $2.03 \sim 2.18$ — N1

6

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SOALAN 5 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2022 (KERTAS 1)

3	$xy = 7 - x$	1	
	$a = 7$	1	
	$3 = 7 - b$ ATAU $-1 = \frac{7-3}{0-b}$	1	
	$b = 4$ $\quad b = 4$	1	4

SOALAN 6 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2022 (KERTAS 2)

8

(a)

R	1	3	4	6	8	10
$\frac{P-200}{R}$	1.00	−0.10	−0.50	−2.00	−2.88	−4.00

1

Graf (Rujuk Lampiran)

1 titik diplot dengan betul dan skala yang seragam — 1

6 titik diplot dengan betul — 1

Garis lurus penyuaian terbaik — 1

(b) i)

P-200 = $aR - bR^2$

$\frac{P-200}{R} = -bR + a$ — 1

pintasan-Y , a= 1.45 ↔ 1.55 — 1

(b) ii)

kecerunan , $-b = m$ and use any two points on LBF to m — 1

b = 0.55 ↔ 0.56 — 1

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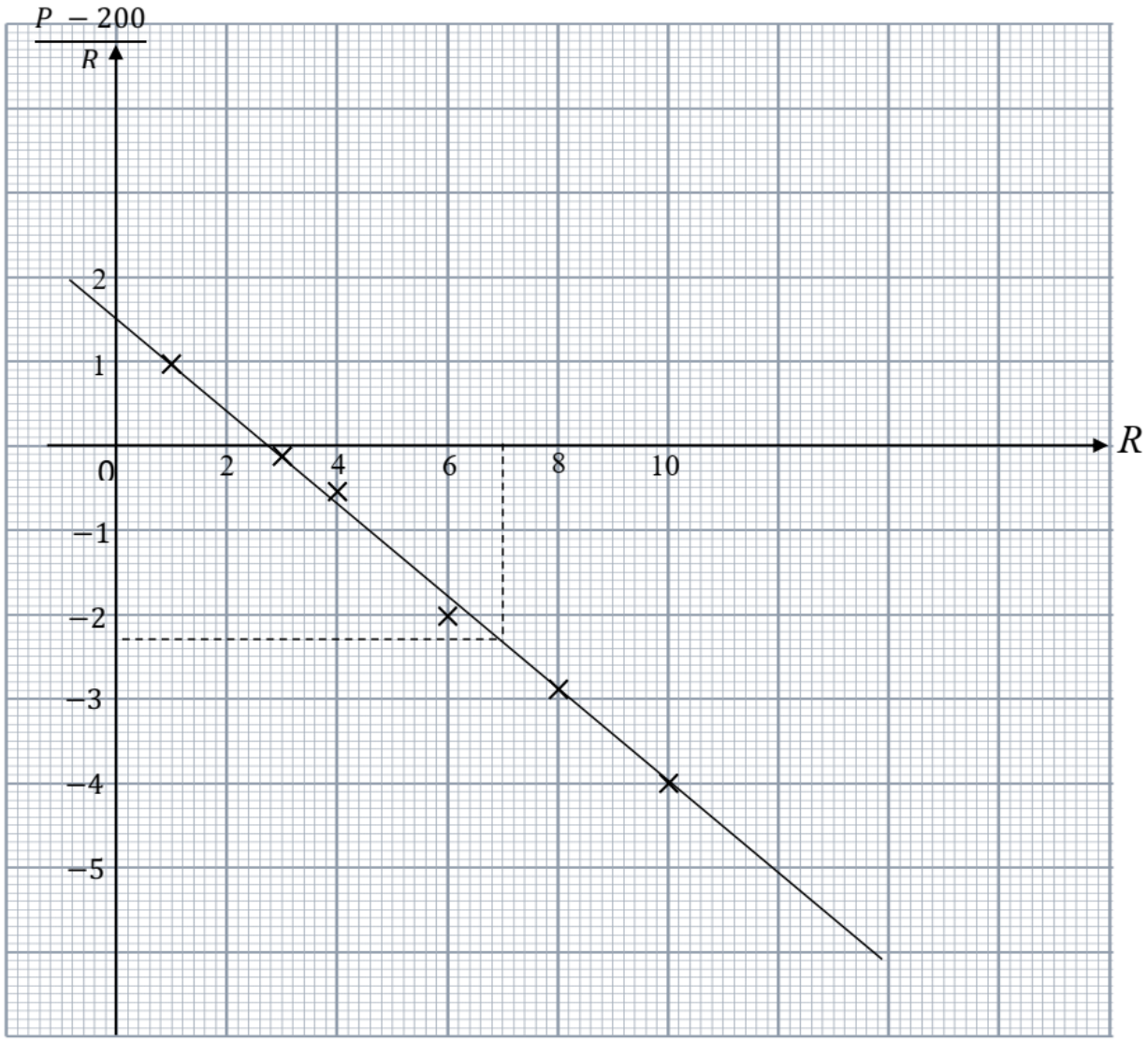
(c)

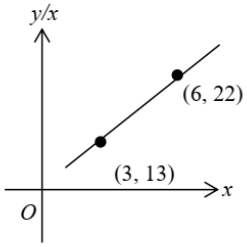
Bila $R = 7$ — 1

$\frac{P-200}{R} = -2.3$

P= 183.9 — 1


$\frac{P-200}{R}$
2
1
0
2
4
6
8
10
R
−1
−2
−3
−4
−5

SOALAN 7 : SOALAN PERCUBAAN SPM NEGERI JOHOR K1 (TANGKAK)

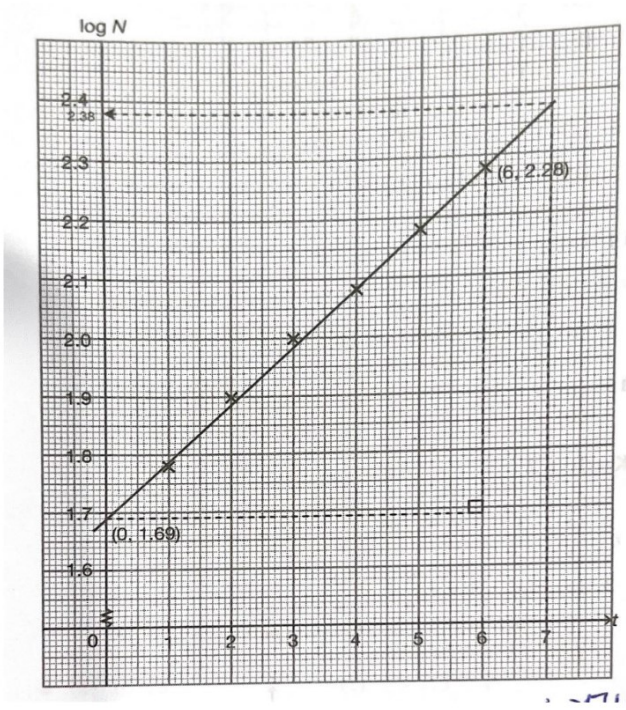
2	(a)			1	3
	(b)		$m = 3$ $a = 3, b = 4$	1 1	

SOALAN 8 : SOALAN PERCUBAAN SPM NEGERI JOHOR K2 (TANGKAK)

10 (a)

Masa/Times, t (hari/days)	1	2	3	4	5
$log_{10}N$	1.78	1.90	2.0	2.08	2.18

1



Plot log N melawan t (skala seragam dan paksi betul) 1m — 1

6 titik diplot dengan betul 2m — 1

5 atau 4 titik diplot betul 1m — 1

Garis lurus terbaik 1m — 1

b) i)
$N = Ar^t$
$log_{10}N = log_{10}A + tlog_{10}r$
$log_{10}N = tlog_{10}r + log_{10}A$ (1m)
$log_{10}A = y\ intercept$

$log_{10}A = 1.69$
$A = 48.98$ (1m)
$log_{10}r = gradient$

$= \frac{2.28-1.69}{6-0}$
$= 0.0983$ (1m)
r = 1.254 (1m)

c) when t = 7,
$log_{10}N = 2.38$
N = 239 (1m)

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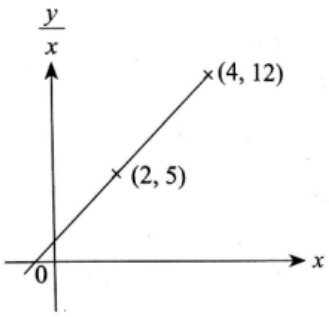
SOALAN 9 : SOALAN PERCUBAAN SPM NEGERI JOHOR K1 (MUAR)

2(a)



2

(b)

$m = \frac{12-5}{4-2} = \frac{7}{2}$

$k^2 = \frac{7}{2}$

k = $\sqrt{\frac{7}{2}}$

1

$12 = \frac{7}{2}(4) + \frac{5}{h}$

h = $-\frac{5}{2}$

1

4

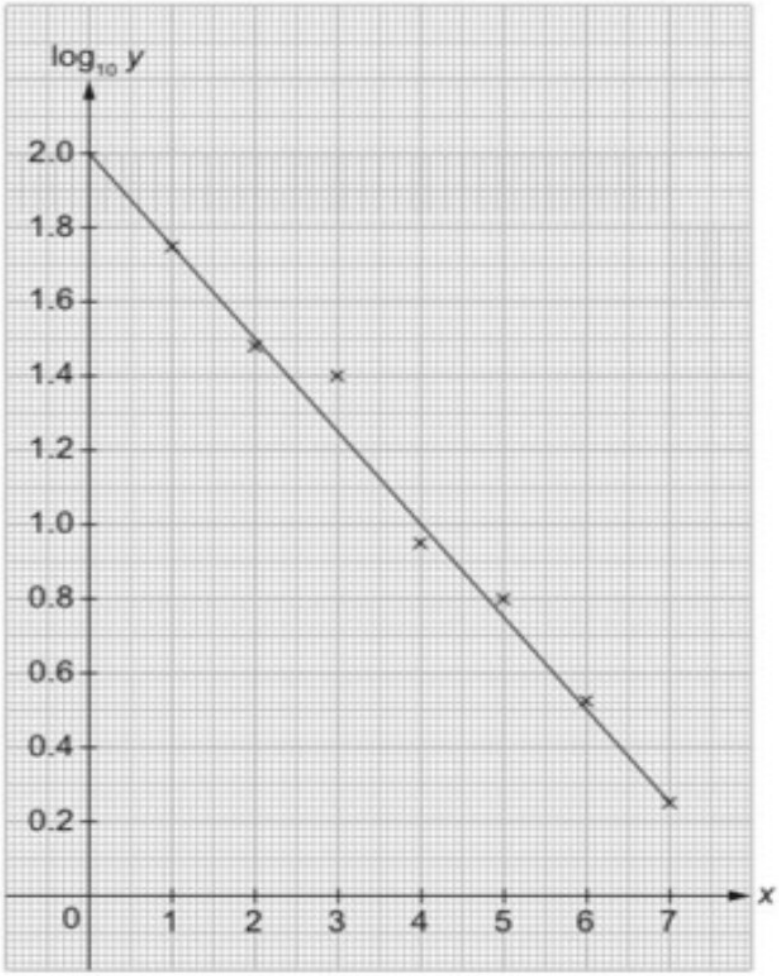
SOALAN 10 : SOALAN PERCUBAAN SPM NEGERI JOHOR K2 (MUAR)

9(a)

x	1	2	3	4	5	6	7
$\log_{10} y$	1.75	1.48	1.40	0.95	0.80	0.53	0.25

N1

Kesemua titik bagi $\log_{10} y$ betul
All points for $\log_{10} y$ *are correct*



satu titik betul/*one point correct* K1
semua titik betul/*all points correct* K1
garis penyuaian terbaik/*line of best fit* K1

9(b)

(i) $y_{\text{salah/wrong}} = 25.1$; $y_{\text{betul/correct}} = 17.78$ N1
Kedua-dua nilai/*Both values*

(ii) $\log_{10} y = -(\log_{10} n)x + \log_{10} m$ P1
$-\log n$ = kecerunan/*gradient* K1
$n = 1.778$ N1
$\log_{10} m = 2.0$ K1
$m = 100$ N1

JUMLAH **10m**

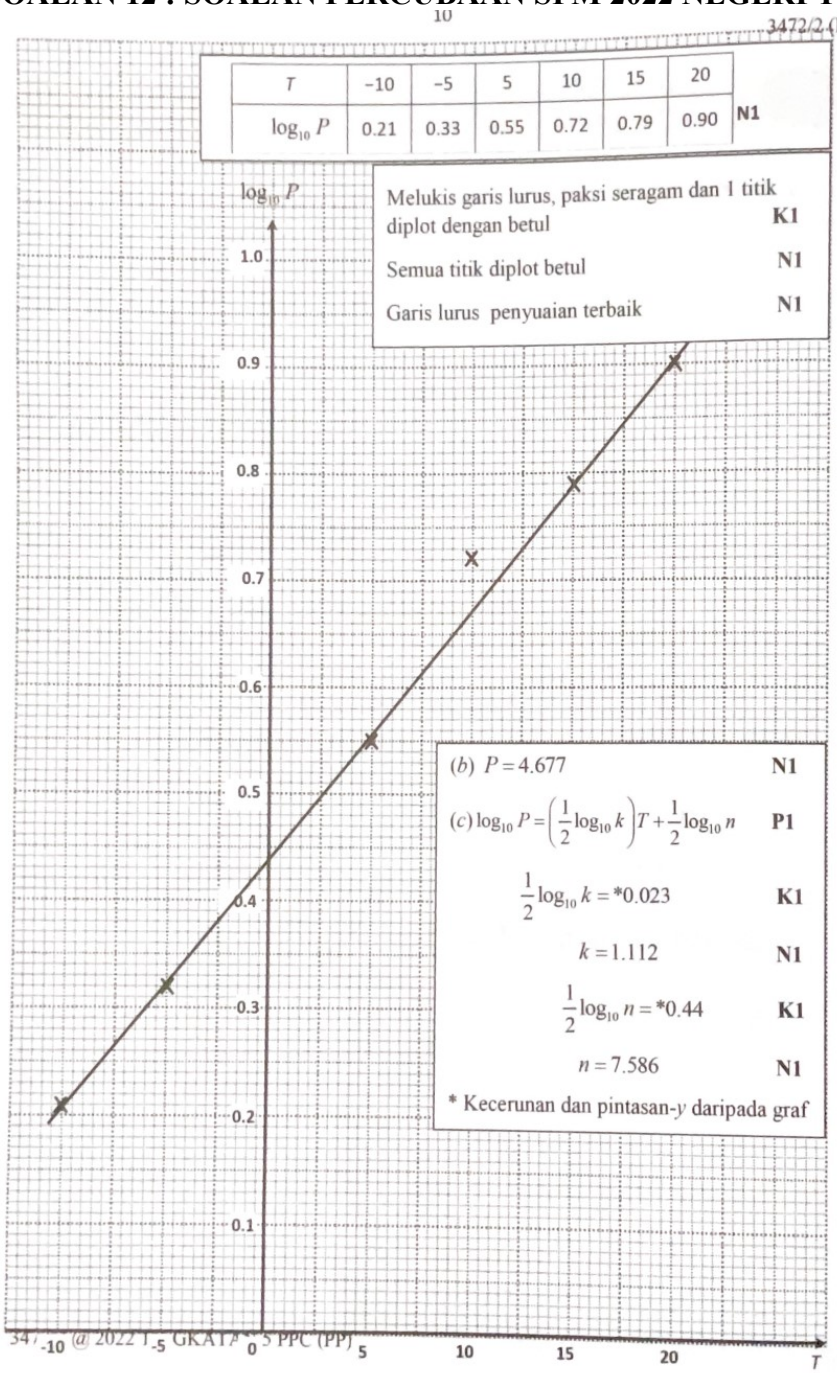
SOALAN 11 : SOALAN PERCUBAAN SPM 2022 NEGERI TERENGGANU 2022 (KERTAS 1)

6	$y = \frac{x}{py} - \frac{q}{p^2}$	P1	
	$\frac{1}{p} = 2$ atau $-\frac{q}{p^2} = -5$	K1	4
	$p = \frac{1}{2}$, $q = \frac{5}{4}$	N1N1	

SOALAN 12 : SOALAN PERCUBAAN SPM 2022 NEGERI TERENGGANU 2022 (KERTAS 2)

T	-10	-5	5	10	15	20
$\log_{10} P$	0.21	0.33	0.55	0.72	0.79	0.90

N1



Melukis garis lurus, paksi seragam dan 1 titik diplot dengan betul — K1

Semua titik diplot betul — N1

Garis lurus penyuaian terbaik — N1

(b) $P = 4.677$ — N1

(c) $\log_{10} P = \left(\frac{1}{2}\log_{10} k\right) T + \frac{1}{2}\log_{10} n$ — P1

$\frac{1}{2}\log_{10} k = *0.023$ — K1

$k = 1.112$ — N1

$\frac{1}{2}\log_{10} n = *0.44$ — K1

$n = 7.586$ — N1

* Kecerunan dan pintasan-y daripada graf

SOALAN 13 : SOALAN PERCUBAAN SPM PUTRAJAYA 2022 (KERTAS 1)

6	$y = \frac{3x^2}{2 - x^3}$ $\frac{1}{y} = \frac{2 - x^3}{3x^2}$	K1	4
	$\frac{1}{xy} = \frac{2}{3}\left(\frac{1}{x^3}\right) - \frac{1}{3}$	K1	
	$h = \frac{2}{3}(-4) - \frac{1}{3}$ atau $1 = \frac{2}{3}(k) - \frac{1}{3}$ $h = -3$ $k = 2$	N1 N1	

SOALAN 14 : SOALAN PERCUBAAN SPM PUTRAJAYA 2022 (KERTAS 2)

10		R	Rujuk Graf pada Lampiran		
	(a)(i)				

$\frac{1}{x}$	1	0.67	0.5	0.4	0.33	0.29
xy	3.80	7.80	9.90	11.20	12	12.50

		Seragam mengikut skala	**K1**	5
	(ii)	P plot sekurang-kurangnya 5 titik dengan betul	**N1**	
		Graf Garis Lurus Penyuaian terbaik	**N1**	
	(b)(i)	$xy = q\left(\frac{1}{x}\right) + p$	**K1**	
		$p = 16$	**N1**	
	(ii)	$q = \frac{13.6 - 6.2}{0.2 - 0.8}$	**K1**	4
		$q = -12.33$	**N1**	
	(c)	$\frac{1}{x} = 0.56$	**N1**	1
		$x = 1.786$		
				10