MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2023

TOPIK TINGKATAN 4
BAB 2

FUNGSI KUADRATIK
(*QUADRATIC FUNCTIONS*)

SUMBER SOALAN:

SOALAN – SOALAN PERCUBAAN

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

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 TERENGGANU 2023 (KERTAS 1)

11

(a) $(3x-2)(x+1)<0$ atau setara

&

Mencari ketaksamaan dengan kaedah Graf @ Jadual @ Garis Nombor K1

$-1<x<\frac{2}{3}$ N1

(b) $-3\left[x^2+\frac{1}{3}x+\left(\frac{\frac{1}{3}}{2}\right)^2-\left(\frac{\frac{1}{3}}{2}\right)^2-\frac{2}{3}\right]$ atau setara K1

$-3\left(x+\frac{1}{6}\right)^2+\frac{25}{12}$ K1

Nilai maksimum $=\frac{25}{12}$ N1

(c) (i) $\alpha+\beta=\frac{-m-1}{3}$ N1

(ii) $\frac{1}{\alpha}+\frac{1}{\beta}=-k$ **&** $\frac{1}{\alpha}\left(\frac{1}{\beta}\right)=k-14$ K1

Mencari $^*k$ dalam sebutan m dan n. K1

[Panduan $\frac{-m-1}{n-2}=\frac{-14m-25}{n-2}$]

$m=14n-26$ N1

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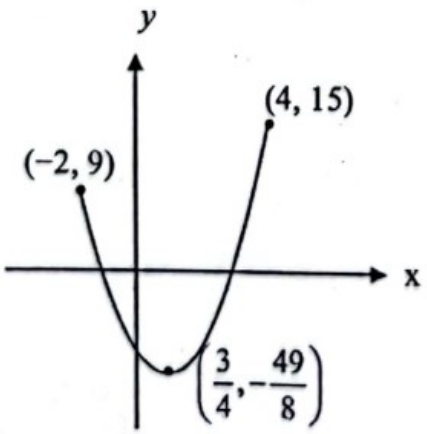
SOALAN 2 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 1)

1	$m+n=2$ dan $mn=-3$ ATAU $(x-3)(x+1)=0$	P1
	$-m+(-n)=-2$ dan $-m\times -n=-3$ ATAU $(x+3)(x-1)=0$	K1
	$x^2+2x-3=0$	N1

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI SEMBILAN 2023 (KERTAS 2)

2(a)	$2\left[x^2-\frac{m}{2}x+\left(\frac{-\frac{m}{2}}{2}\right)^2-\left(\frac{-\frac{m}{2}}{2}\right)^2+\frac{n}{2}\right]$	K1
	$2\left(x-\frac{m}{4}\right)^2-\frac{m^2}{8}+n$	K1
	$\frac{m}{4}=\frac{3}{4}$ atau $-\frac{m^2}{8}+n=-\frac{49}{8}$	K1
	$m=3$	N1
	$n=-5$	N1
(b)	 Bentuk ◡ dan titik Min.	N1
	Titik (-2,9) dan (4, 15)	N1

SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI KELANTAN 2023 (KERTAS 1)

7	$\frac{1}{2}(2x+10)(5x-20)\sin 30° = 1700$	K1	
	$x = \frac{-5 \pm \sqrt{5^2 - 4(5)(-3500)}}{2(5)}$	K1	
	$x = 26$	N1	
	62 m	N1	5
	110 m	N1	

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

13 (a)	$y = \frac{2x^2 + 4x}{3}$	P1	
	$\frac{2x^2 + 4x}{3} < 10$	K1	
	$(x+5)(x-3) < 0$	K1	
	$-5 < x < 3$	N1	
13 (b)	$2\left[x^2 - 4x + \left(\frac{-4}{2}\right)^2 - \left(\frac{-4}{2}\right)^2 - 5\right]$	K1	
	$2(x-2)^2 - 18$	N1	8
	$a = 2$ dan $b = -2$ dan $c = -18$	N1	
	Nilai minimum = -18	N1	

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

6 (a)	$m+(n-9)=\frac{n-1}{2}$ atau $m(n-9)=\frac{7}{2}$	P1	
	$m(17-2m-9)=\frac{7}{2}$ atau $\left(\frac{17-n}{2}\right)(n-9)=\frac{7}{2}$	K1	
	$(2m-7)(2m-1)=0$ atau $(n-10)(n-16)=0$	K1	
	$m=\frac{1}{2}$	N1	
	$n=16$	N1	8
6 (b)	$2\left[x^2-\frac{15x}{2}+\left(\frac{-15/2}{2}\right)^2-\left(\frac{-15/2}{2}\right)^2+\frac{7}{2}\right]$	K1	
	$2\left(x-\frac{15}{4}\right)^2-\frac{169}{8}$	N1	
	$x=\frac{15}{4}$	N1	

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

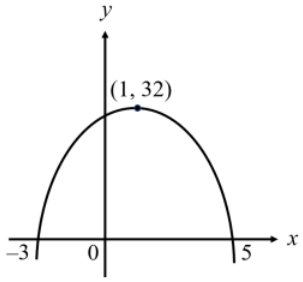
14

a) $(h-1)^2 - 4(2)(2k^2) = 0$ — K1
$h = 1 \pm 4k$ — N1

b) i) $-2\left(x^2 - 2x + \left(\frac{-2}{2}\right)^2 - \left(\frac{-2}{2}\right)^2\right) + 30$ atau setara — K1
$-2(x-1)^2 + 32$ — N1
$(1, 32)$ — N1

Nota: K0N0 bila guna rumus $f(x) = (x + \frac{b}{2a})^2 + \frac{b^2}{4a} + c$

b) ii) $-2(x-5)(x+3)$ — N1



Bentuk graf — P1
Punca-punca dan titik maksimum dilabel — P1

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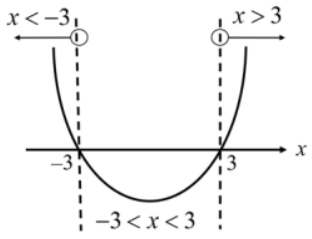
SOALAN 8 : SOALAN PERCUBAAN SPM NEGERI SABAH 2023 (KERTAS 2)

2

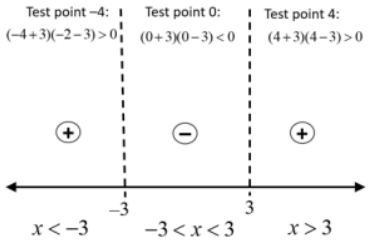
a) $m + n = -\frac{-6}{2}$ dan $mn = \frac{7}{2}$ — K1
$3(3) + 2$ atau $9\left(\frac{7}{2}\right) + 3(3) + 1$ — K1
$2x^2 - 22x + 83 = 0$ — N1

b) $(x-3)(x+3) > 0$ — K1

DAN



atau



atau

	Range of values of x		
	$x < -3$	$-3 < x < 3$	$x > 3$
$x + 3$	–	+	–
$x - 3$	–	+	–
$(x+3)(x-3)$	+	–	+

atau mana-mana kaedah yang betul

$x < -3$ and $x > 3$ — N1
3 — N1

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

2	Guna $b^2-4ac=0$ $(2q)^2-4(p+1)(3)=0$ **K1** $p=\frac{q^2-3}{3}$ @ $p=\frac{q^2}{3}-1$ **N1**	2	2

SOALAN 10 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 1)

3(a)

$\alpha\left(\frac{1}{\alpha}\right)=\frac{3m+2}{m}$ **K1**

$m=-1$ **N1**

2

(b)(i) Guna kaedah penyempurnaan kuasa dua

$f(x)=-\left[x^2-2px+\left(\frac{-2p}{2}\right)^2-\left(\frac{-2p}{2}\right)^2+5p\right]$ **K1**

Samakan dengan nilai maksimum 6

$p^2-5p=6$ **K1**

$p=6, p=-1$ **N1**

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(ii) $f(x)=(x-6)^2-6$ @ $f(x)=x^2-12x+30$ **N1**

6

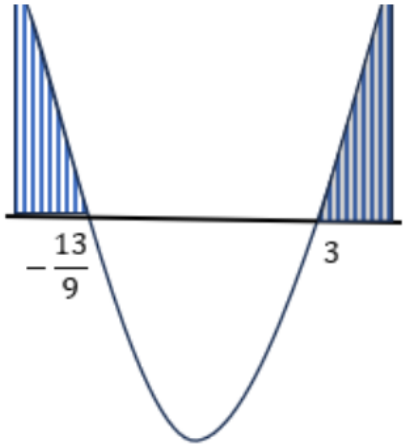
SOALAN 11 : SOALAN PERCUBAAN SPM SBP 2023 (KERTAS 2)

4(a)(i)	$f(x)=a\left(x-\frac{7}{2}\right)^2+\frac{15}{2}$ **K1** $10=a\left(0-\frac{7}{2}\right)^2+\frac{15}{2}$ **K1** $f(x)=\frac{10}{49}\left(x-\frac{7}{2}\right)^2+\frac{15}{2}$ **N1**	3	
(a)(ii)	$f(x)=\frac{10}{49}(6-\frac{7}{2})^2+\frac{15}{2}$ **K1** 8.776 **N1** paksi simetri @ $x=\frac{7}{2}$ **N1**	3	6

SOALAN 12 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 1)

3	(a)	$(2-m)^2-4(2)(2)<0$	1	
		$(m+2)(m-6)<0$	1	
		$-2<m<6$	1	
	(b) (i)	$-5\left(x^2-6x+\left(-\frac{6}{2}\right)^2-\left(-\frac{6}{2}\right)^2\right)$	1	
		3	1	
	(ii)	45	1	6

SOALAN 13 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2023 (KERTAS 2)

2(a) i	7	1	
ii	10	1	
(b)	$h+k=-\frac{2}{3}$ dan $hk=-2$	1	
	$\frac{h}{k}+\frac{k}{h}=\frac{(-\frac{2}{3})^2-2(-2)}{-2}$ atau $\frac{h}{k}\times\frac{k}{h}=1$	1	
	$9x^2+20x+9=0$ atau setara	1	
(c)	$(3h-1)^2-4(1)(2h+10)>0$	1	
		1	**8**
	$h>3$, $h<-\frac{13}{9}$	1	

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

5	(a)		$(3,-4)$	N1	
	(b)		$x=5$	N1	
	(c)		$m=3$ $1-n=4$ $n=-3$	N1 K1 N1	
					5

SOALAN 15 : SOALAN PERCUBAAN SPM NEGERI SELANGOR SET 1 2023 (KERTAS 2)

7	(*a*)		Luas segi empat tepat – Luas segi empat sama $3y(2y) - y^2 \geq y^2 + 4$ Selesaikan ketaksamaan kuadratik secara kaedah lakaran graf / jadual / garis nombor $y \leq -1$ atau $y \geq 1$ $\therefore y \geq 1$ ($y > 0$, panjang)	K1 K1 K1 N1	
	(*b*)		$2x^2 + 6x - 3 = 0$ $\alpha + \beta = \frac{-6}{2}$ & $\alpha\beta = \frac{-3}{2}$ Guna $\alpha + \beta$ & $\alpha\beta$ ke dalam $\alpha^2 + \beta^2$ $\alpha^2 + \beta^2 = (-3)^2 - 2\left(\frac{-3}{2}\right)$ 12	 K1 K1 N1	
					7

SOALAN 16 : SOALAN PERCUBAAN SPM NEGERI PERAK 2023 (KERTAS 1)

10	(a)	$\alpha + \beta = -1$ dan $\alpha\beta = -\frac{3}{2}$	**1**	**6**
		$\frac{2}{\alpha} + \frac{2}{\beta} = \frac{4}{3}$ dan $\left(\frac{2}{\alpha}\right)\left(\frac{2}{\beta}\right) = -\frac{8}{3}$	**1**	
		$3x^2 - 4x - 8 = 0$	**1**	
	(b)	$\frac{30}{2} = 3b$	**1**	
		$b = 5$		
		$-\frac{a}{2} = 3 + b$	**1**	
		$a = -16$	**1**	