

MODUL TOPIKAL
SOALAN PERCUBAAN SPM 2022
SKEMA JAWAPAN

TOPIK TINGKATAN 5

BAB 8

KINEMATIK GERAKAN LINEAR
(KINEMATICS LINEAR MOTION)

SUMBER SOALAN:

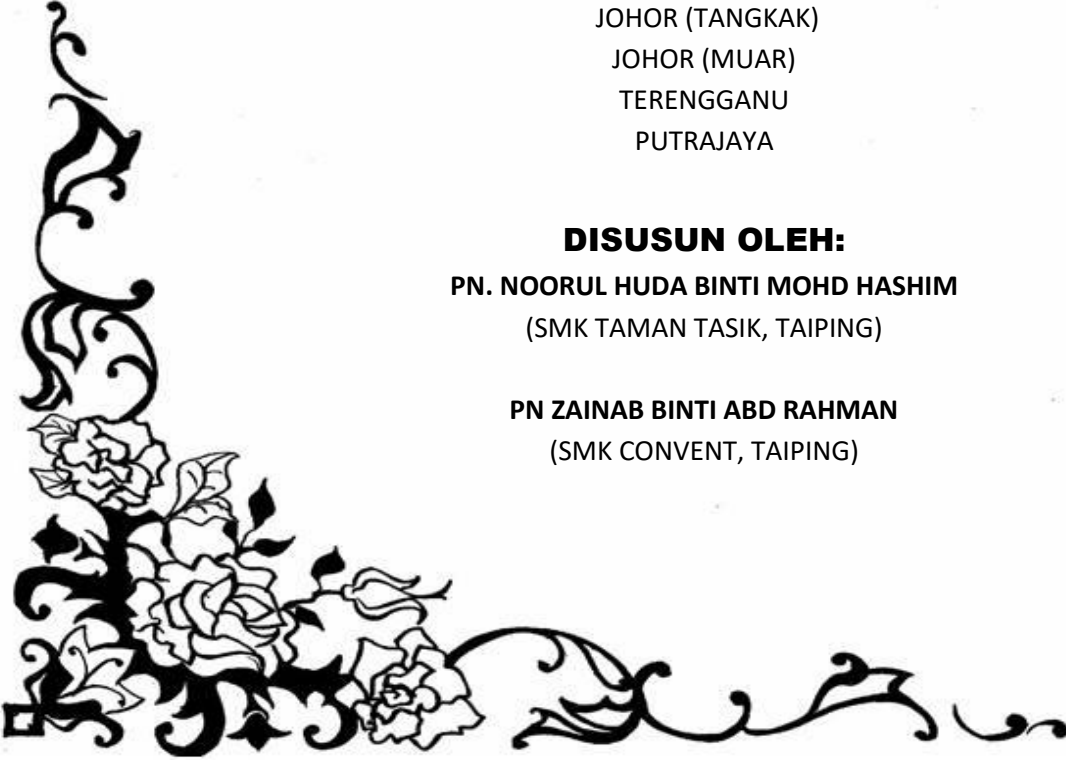
SOALAN – SOALAN PERCUBAAN

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

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

12	(a) $a_Q = -2$ atau $a_P = 4t - 11$	K1
	Zarah Q kerana $a_Q = -2$	N1
	(b) $(2t - 3)(t - 4) < 0$ dan $-2t + 6 < 0$	K1
	$3 < t < 4$	N1
	(c) $s_P = \frac{2}{3}t^3 - \frac{11}{2}t^2 + 12t + c$	P1
	apabila $t = 0$, $s_P = -6$	K1
	$s_P = \frac{2}{3}(3)^3 - \frac{11}{2}(3)^2 + 12(3) - 6$	K1
	$-\frac{3}{2}$	N1
	(d) $2 \left[\frac{1}{2}(3)(6) \right]$ atau setara	K1
	18	N1
		10 markah

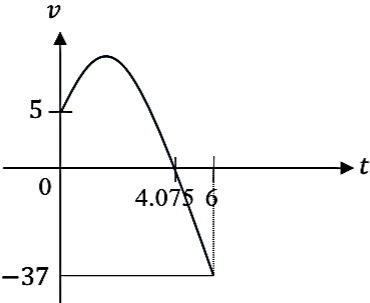
SOALAN 2 : SOALAN PERCUBAAN NEGERI SELANGOR (MODUL PINTAS SET A)

14	(a) $v = 8t^2 - 48t + 40$ $s = \frac{8t^3}{3} - 24t^2 + 40t$ $16t - 48 = 0 \Rightarrow t = 3$ $s = \frac{8(3)^3}{3} - 24(3)^2 + 40(3)$ $= -24$	K1	4	10
	(b) Bila bola snuker bertukar arah, $v = 0$ $8t^2 - 48t + 40 = 0$ $8(t - 1)(t - 5) = 0$ $t = 1 \text{ or } t = 5$	K1 K1 N1		
	(c) Bila $a = 16 \text{ ms}^{-2}$, $16t - 48 = 16$ ATAU $\cup$ dengan pintasan-$y = 40$ $t = 4$ Bila $t = 4$, $v = 8(4)^2 - 48(4) + 40$ ATAU garis $x = 4$ dilukis kepada graf $v = -24$ dan menuju ke nilai v negatif Halaju negatif menunjukkan bola snuker bergerak ke arah kiri apabila pecutannya ialah 16 ms^{-2}.	K1 K1 N1		

SOALAN 3 : SOALAN PERCUBAAN SPM NEGERI MELAKA 2022

14 (a)	22	1	10
	$-8t^2 + 8t + 10 = 0$ atau $6t^2 - 9t - 12 = 0$	1	
	$t = 1.7247$ atau $t = -0.7247$ (diabaikan kerana $t > 0$) or $t = 2.3508$ atau $t = -0.8508$ (diabaikan kerana $t > 0$)	1	
	Zarah Q	1	
(b)	$6t^2 - 9t - 12 = -(-8t^2 + 8t + 10)$	1	
	$r = 2$ atau -0.7857 (diabaikan kerana $t > 0$)	1	
(c)	$(8t - 8t^2 + 10) - (6t^2 - 9t - 12)$ atau $17t - 14t^2 + 22$	1	
	$17 - 28t = 0$	1	
	$17(0.6071) - 14(0.6071)^2 + 22$ or equivalent	1	
	27.16m	1	

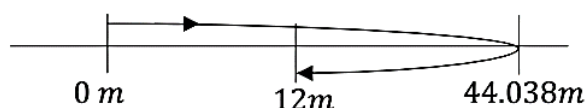
SOALAN 4 : SOALAN PERCUBAAN SPM NEGERI JOHOR (TANGKAK)

13	(a) $a = 11 - 6t$ $v = \int 11 - 6t \, dt$ $v = 11t - \frac{6t^2}{2} + c$ $v = 11t - 3t^2 + c$ Pada masa $t = 0, v = 5$, $5 = 11(0) - 3(0)^2 + c$ $5 = c$ Maka, $v = 11t - 3t^2 + 5$ (b) $v = 11(6) - 3(6)^2 + 5$ $v = -37$  Bentuk parabola  1 markah Titik (0,5), (4.075,0) dan (6,-37) diberi 1 markah. (c) (i) $s = \int 11t - 3t^2 + 5 \, dt$ $s = \frac{11}{2}t^2 - \frac{3t^3}{3} + 5t + c$ Pada masa $t = 0, s = 0$, $s = 0$ Maka, $s = \frac{11}{2}t^2 - t^3 + 5t$ Apabila $t = 6$, $s = \frac{11}{2}(6)^2 - (6)^3 + 5(6)$ $s = 12$	1 1 1 1 1 1 1 1	
----	---	---	--

(ii) Apabila $t = 4.075$,

$$s = \frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075)$$

$$= 44.038$$



$t = 0$ $t = 6$ $t = 4.075$
Jumlah jarak = $44.038 + (44.038 - 12)$

$$= 76.076 \text{ m}$$

Kaedah 2:

$$\text{Jumlah jarak} = \int_0^{4.075} 11t - 3t^2 + 5 \, dt + \left| \int_{4.075}^6 11t - 3t^2 + 5 \, dt \right|$$

$$= \left[\frac{11}{2}t^2 - t^3 + 5t \right]_0^{4.075} + \left| \left[\frac{11}{2}t^2 - t^3 + 5t \right]_{4.075}^6 \right|$$

$$= \frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075) - \frac{11}{2}(0)^2 - (0)^3 + 5(0) + \left| \frac{11}{2}(6)^2 - (6)^3 + 5(6) - \left(\frac{11}{2}(4.075)^2 - (4.075)^3 + 5(4.075) \right) \right|$$

$$= 44.038 + |-32.038|$$

$$= 76.076$$

1

1

1

10

1

1

1

SOALAN 5 : SOALAN PERCUBAAN SPM NEGERI JOHOR (MUAR)

15(a)	$= \int (8 - 2t) dt$ $= 8t - t^2 + c$ $t = 2, v = 16,$ $16 = 8(2) - (2)^2 + c$ $16 = 16 - 4 + c$ $c = 4$ $8(0) - (0)^2 + 4$ $4ms^{-1}$	 K1 K1 K1 N1
15(b)	$\frac{dv}{dt} = a = 0$ $8 - 2t = 0$ $t = 4$ $8(4) - (4)^2 + 4$ $20ms^{-1}$	 K1 K1 N1
15(c)	Jarak dilalui dalam saat ke-3, <i>Distance travelled in the 3rd second,</i> $s = \int_2^3 (8t - t^2 + 4) dt$ $= \left[4t^2 - \frac{1}{3}t^3 + 4t \right]_2^3$ $= \left[4(3)^2 - \frac{1}{3}(3)^3 + 4(3) \right]$ $- \left[4(2)^2 - \frac{1}{3}(2)^3 + 4(2) \right]$ $= 17\frac{2}{3} \text{ m}$	 K1 K1 N1
JUMLAH		10m

SOALAN 6 : SOALAN PERCUBAAN SPM 2022 NEGERI TERENGGANU 2022

12	(a) $v = 8$	N1	
	(b) $2 - 2t = 0$	K1	
	$t = 1$		
	$v = 8 + 2(1) - (1)^2$	K1	
	$= 9$	N1	
	(c) $8 + 2t - t^2 = 0$ dan selesaikan pers. kuadratik	K1	
	$t = 4$	N1	
	(d) $s = \int (8 + 2t - t^2) dt$		10
	$s = 8t + t^2 - \frac{t^3}{3} + c$	K1	
	$s = 8(4) + (4)^2 - \frac{(4)^3}{3}$ atau $s = 8(6) + (6)^2 - \frac{(6)^3}{3}$	K1	
	Jumlah jarak = $\frac{80}{3} + [8(4) + (4)^2 - \frac{(4)^3}{3} - [8(6) + (6)^2 - \frac{(6)^3}{3}]]$	K1	
	$= \frac{124}{3}$	N1	

SOALAN 7 : SOALAN PERCUBAAN SPM PUTRAJAYA 2022

13	(a)	$v = -4 \text{ ms}^{-1}$	P1	1
	(b)	$\frac{dv}{dt} = 8t - p$ $p = 15$ $a = 8t - 15$	K1 N1 N1	3
	(c)	$4t^2 - 15t - 4 < 0$ $(4t + 1)(t - 4) < 0$ $0 < t < 4$	K1 K1 N1	3
	(d)	$\int_0^4 4t^2 - 15t - 4 \, dt$ $\left \frac{4}{3} (4)^3 - \frac{15}{2} (4)^2 - 4(4) - 0 \right $ $50\frac{2}{3} \text{ metres}$	K1 K1 N1	
			10	