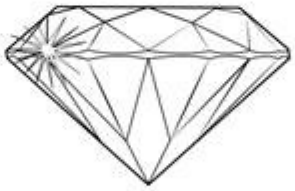
KEMENTERIAN PENDIDIKAN
JABATAN PENDIDIKAN NEGERI PERAK



MODUL BLUE DIAMOND

Matematik Tambahan

TINGKATAN 5

Bab 2

PEMBEZAAN
(*Differentiation*)

SKEMA JAWAPAN

JABATAN PENDIDIKAN NEGERI PERAK
We Deliver

SKEMA JAWAPAN KERTAS 1

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
1	$\frac{dy}{dx} = \frac{[(3x^2+4)(2)] - [2x(6x)]}{(3x^2+4)^2}$	1	2
	$\frac{8-6x^2}{(3x^2+4)^2}$	1	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 1 | Soalan 2a

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
2	$\frac{dy}{dx} = 2x - 7 \quad , m_1 = 1$	1	5
	$1 = 2x - 7$ atau $x = 4$	1	
	$y = 4^2 - 7(4)$ atau $y = -12$ atau $A(4, -12)$	1	
	$y + 12 = -1(x - 4)$	1	
	$y = -x - 8$	1	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 1 | Soalan 12

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
3(a)			8

Fungsi	$\frac{dy}{dx}$	Pola
$y = 4x$	4	$4(1)x^{1-1}$
$y = 4x^2$	$8x$	$4(2)x^{2-1}$
$y = 4x^3$	$12x^2$	$4(3)x^{3-1}$

$\frac{dy}{dx}$ betul	1
Pola betul	1
$y = ax^n$ atau $\frac{dy}{dx} = anx^{n-1}$	1
Jika $y = ax^n$, maka $\frac{dy}{dx} = anx^{n-1}$	1

(b)	$y=\frac{216}{x^2}$ atau $A=3x^2+6x\left(\frac{216}{x^2}\right)$ atau $\frac{dA}{dx}=6x-\frac{1296}{x^2}$	**1**	
	$6x-\frac{1296}{x^2}=0$ *or* $x=6$	**1**	
	$\frac{d^2A}{dx^2}=6+\frac{2432}{(6)^3}$ *or* $\frac{466}{27}$ / 17.26	**1**	
	A adalah minimum. Ini adalah kerana nilai $\frac{d^2A}{dx^2}>0$ atau nilai $\frac{d^2A}{dx^2}$ adalah positif.	**1**	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 1 | Soalan 13

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
4(a)	$\frac{dy}{dx}=2x$	**1**	
	Apabila $x = 2$, $\frac{dy}{dx}=4$	**1**	
	4 (0.01)	**1**	
	4.04	**1**	**7**
(b)	$\frac{dV}{dx}=1200x^2$	**1**	
	$1200\ (\ 1.5\ )^2 \times 0.005$	**1**	
	13.5 cm^3	**1**	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 2 | Soalan 3

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
5	$y+\delta y=2(x+\delta x)^2-(x+\delta x)+1$	**1**	
	$\frac{\delta y}{\delta x}=4x+2\delta x-1$	**1**	
	had $\delta x\to 0$ $\frac{\delta y}{\delta x}=4x-2(0)-1$	**1**	**4**
	$\frac{dy}{dx}=4x-1$	**1**	

Sumber : Ticket To Victory 1 | Kertas 1 | Set 3 | Soalan 11

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
6(a)	$A = \pi r^2$ $A + \delta A = \pi (r + \delta r)^2$ $A + \delta A = \pi r^2 + 2\pi r\delta r + \pi(\delta r)^2$ $\delta A = 2\pi r\delta r + \pi(\delta r)^2$ $\frac{\delta A}{\delta r} = 2\pi r + \pi\delta r$ $\frac{dA}{dr} = \lim_{\delta r \to 0} \frac{\delta A}{\delta r}$ $\frac{dA}{dr} = 2\pi r$	1 1 1 1	**7**
(b)	$r = 4\,(12) = 48$ $\frac{dA}{dt} = 2\pi(48) \times 4$ $\frac{dA}{dt} = 384\pi$	1 1 1	

Sumber : Ticket To Victory 2 | Kertas 1 | Set 1 | Soalan 4

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
7(i)	$(1, -\frac{5}{6})$ dan $(-\frac{1}{2}, \frac{7}{24})$	1 , 1	**4**
(ii)	$f``(1) = 3$, titik minimum $f``\left(-\frac{1}{2}\right) = -3$, titik maksimum	1 1	

Sumber : Ticket To Victory 2 | Kertas 1 | Set 1 | Soalan 14a

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
8	$x = -1, x = 3$ $x^2(2) - (x+1)(2x-2) + x^2 - 2x + 5 = 10$ $\frac{d^2y}{dx^2} = 2$ *or* $\frac{dy}{dx} = 2x - 2$	1,1 1 1	**4**

Sumber : Ticket To Victory 2 | Kertas 1 | Set 2 | Soalan 2

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
9	$\delta x = -10$ atau $\frac{dV}{dx} = 7500$ $7500 \times (-10)$ -75000	1 1 1	**3**

Sumber : Modul Gempur | Kertas 1 | Set 1 | Soalan 1

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
10(a)	$\frac{dy}{dx} = 12x^2 - 24x + 9$ $\frac{d^2y}{dx^2} = 24x - 24$	1 1	**8**
(b)	$\frac{dy}{dx} = 0$ $(6x-3)(2x-3) = 0$ $x = \frac{1}{2}, x = \frac{3}{2}$ $y = -2, y = -4$ $\left(\frac{1}{2}, -2\right), \left(\frac{3}{2}, -4\right)$ $\left(\frac{1}{2}, -2\right), \frac{d^2y}{dx^2} = 24\left(\frac{1}{2}\right) - 24 = -12 < 0$ Titik maksimum $\left(\frac{3}{2}, -4\right), \frac{d^2y}{dx^2} = 24\left(\frac{3}{2}\right) - 24 = 12 > 0$ Titik minimum	1 1 1 1 1 1	

Sumber : Modul Gempur | Kertas 1 | Set 1 | Soalan 15

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
11	$u = (3x+1)^2$ dan $v = 1 - 2x$ Maka , $\frac{du}{dx} = 2(3x+1)(3)$, $\frac{dv}{dx} = -2$ $= 6(3x+1)$ $= \frac{(1-2x)[6(3x+1)] - (3x+1)^2(-2)}{(1-2x)^2}$ $\frac{= 2(3x+1)(4-3x)}{(1-2x)^2}$	1 1 1	**3**

Sumber : Modul Gempur | Kertas 1 | Set 2 | Soalan 2

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
12(a)	Isi pada = 32π $\pi r^2 h = 32\pi$ $h = \frac{32}{x^2}$ Jumlah luas permukaan $\pi r s + \pi r^2 + 2\pi r h$ $\pi(x)(3x) + \pi(x)^2 + 2\pi(x)(\frac{32}{x^2})$ $4\pi x^2 + \frac{64\pi}{x}$ $4\pi(x^2 + \frac{16}{x})$	1 1 1	**8**
(b)	$\frac{dL}{dx} = 0$ $\frac{dL}{dx} = 8\pi x - \frac{64\pi}{x^2}$ $8\pi x - \frac{64\pi}{x^2} = 0$ $x = 2$	1 1	
(c)	Petua rantai $\frac{dL}{dt} = \frac{dL}{dx} \times \frac{dx}{dt}$ atau setara $42\pi = (8\pi x - \frac{64\pi}{x^2}) \times \frac{dx}{dt}$ Gantikan x = 4 $42\pi = [8\pi(4) - \frac{64\pi}{(4)^2}] \times \frac{dx}{dt}$ $\frac{dx}{dt} = 1.5 \text{ cms}^{-1}$	1 1 1	

Sumber : Modul Gempur | Kertas 1 | Set 2 | Soalan 12

SKEMA JAWAPAN KERTAS 2

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
1	$\frac{dV}{dh} = 5 + h^2$	1	
	$3 = \left(5 + (4)^2\right) \times \frac{dh}{dt}$	1	3
	$\frac{dh}{dt} = \frac{1}{7}$ cm s^{-1}	1	

Sumber : Ticket To Victory 1 | Kertas 2 | Set 1 | Soalan 9a

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
2	$\frac{dy}{dx} = 4x - 4$	1	
	$m_{norm} = -\frac{1}{4(2) - 4}$	1	4
	$y - (-3) = -\frac{1}{4}(x - 2)$	1	
	$x + 4y + 10 = 0$	1	

Sumber : Ticket To Victory 1 | Kertas 2 | Set 2 | Soalan 9a

NO.	BUTIRAN	PECAHAN MARKAH	JUMLAH
3	$\frac{j}{h} = \frac{0.3}{0.4}$	1	
	$\frac{j}{h} = \frac{3}{4}$ $j = \frac{3}{4}h$		
	Isipadu air, $I = \frac{1}{3}\pi j^2 h$ $I = \frac{1}{3}\pi (\frac{3}{4}h)^2 h$ $I = \frac{9}{12}\pi h^3$ $I = \frac{3}{4}\pi h^3$	1	
	$\frac{dI}{dh} = (3)\frac{3}{4}\pi h^2$ $\frac{dI}{dh} = \frac{9}{4}\pi h^2$	1	6

	Kadar perubahan tinggi paras air pada ketika tinggi parasnya 0.5m = $\frac{dh}{dt}$ $\frac{dh}{dt} = \frac{dh}{dI} \text{ X } \frac{dI}{dt}$ $\frac{dh}{dt} = \frac{4}{9\pi h^2} \times 0.02$ $\frac{dh}{dt} = \frac{4}{9\pi(0.5)^2} \times 0.02$ $\frac{dh}{dt} = 0.01132 ms^{-1}$	1 1 1	

Sumber : Ticket To Victory 2 | Kertas 2 | Set 2 | Soalan 5