

3472/2 (MS)
Additional
Mathematics
Marking
Scheme
October
2007

PERSIDANGAN KEBANGSAAN PENGETUA
SEKOLAH MENENGAH MALAYSIA
CAWANGAN TERENGGANU
DENGAN KERJASAMA
JABATAN PELAJARAN TERENGGANU

PEPERIKSAAN AKHIR TAHUN 2007
TINGKATAN 4

ADDITIONAL MATHEMATICS
PAPER 2
MARKING SCHEME

This marking scheme consists of 10 printed pages.

INSTRUCTIONS FOR EXAMINERS

1. MARKING GUIDE

- 1.1 Mark all the answers.
- 1.2 Do not mark working / answer that has been cancelled.
- 1.3 Give the mark P / K / N in line with steps of calculation given by the students.
- 1.4 Give the mark P0 / K0 / N0 for the incorrect working / answer.
- 1.5 If more than one final answer is given, mark all the solution and choose the answer with the highest mark.
- 1.6 Accept other correct methods which are not given in the marking scheme.

2. NOTATION

- P** – The mark is given if the working / answer in accordance with the **Knowledge** assessed as stated in the marking scheme.
- K** – The mark is given if the working / answer in accordance with the **Skills** assessed as stated in the marking scheme.
- N** – The mark is given if the working / answer in accordance with the **Values** assessed as stated in the marking scheme.
- PA** – Subtract 1 mark (only once) from the N mark when students make an early rounding of numbers.
- KP** – Subtract 1 mark (only once) from the P mark or N mark when students do not write the important steps of the calculations.

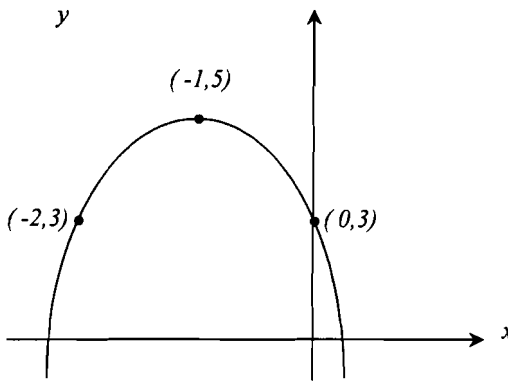
- 3. Accept answers correct to 4 significant figures unless stated otherwise in the marking scheme.
- 4. Accept other correct methods which are not given in the marking scheme.
- 5. Accept answers in Bahasa Melayu.
- 6. Calculating total marks.

$$\frac{\sum \text{Marks from Paper 1} + \sum \text{Marks from Paper 2}}{180} \times 100\%$$

SECTION A [40 MARKS]		
No.	MARKING SCHEME	Σ MARKS
1	$y = 4 - x$ and P1 $x^2 + 2x + (4 - x) = 10.$ K1 $x^2 + x - 6 = 0$ $(x - 2)(x + 3) = 0$ K1 $x = 2, -3$ N1 $y = 2, 7$ N1	5
	<p style="text-align: center;">OR</p> $x = 4 - y$ P1 $(4 - y)^2 + 2(4 - y) + y = 10$ K1 $y^2 - 9x + 14 = 0$ $(y - 2)(y - 7) = 0$ K1 $y = 2, 7$ N1 $x = 2, -3$ N1	
2	<p>(a) $4 - 2x = y$ $4 - y = 2x$ K1 $g^{-1}(x) = \frac{4 - x}{2}$ N1</p> <p>(b) $g^{-1}h(x) = \frac{4 - (2 + x^2)}{2}$ K1 $= \frac{2 - x^2}{2}$ N1</p> <p>(c) $fg(g^{-1}) = \frac{2}{2 - (\frac{4 - x}{2})}$ K1 $f(x) = \frac{4}{x}$ N1</p>	6

No.	MARKING SCHEME	Σ MARKS
<p>3</p>	<p> $-2(x^2 - 4x) - 5$ K1 $-2\{(x - 2)^2 - 4\} - 5$ $-2(x - 2)^2 + 3$ N1 </p> <p>(a) Maximum, 3 N1 (both) x is 2. N1</p> <p>(b)</p> <p> maximum shape N1 passing thro' (2, 3) N1 <u>and</u> two other points N1 </p>	<p>7</p>
<p>4</p>	<p>(a) $m = 50.5 + \left(\frac{\frac{1}{2}(40) - 15}{14}\right) 10$ P1 for 50.5 K1 = 54.07 N1</p> <p>(b) $\bar{x} = \frac{\sum fx}{\sum f} = \frac{2160}{40}$ K1 = 54 N1</p> <p> $\sigma = \sqrt{\frac{122150}{40} - (54)^2}$ K1 P1 for 122150 = 11.74 N1 </p>	<p>8</p>

No.	MARKING SCHEME	Σ MARKS
5	<p>(a) $\theta = 1.1762$ radian P1</p> <p>(b) DC = 8 cm P1</p> <p>$S_{BD} = 5(1.1762)$ K1</p> <p>Perimeter = $5(1.1762) + DC + 12$ K1</p> <p>$= 25.881$ N1</p> <p>(c) $A_{ABD} = \frac{1}{2}(5)^2(1.1762)$ K1 or $A = \frac{1}{2}(5)(12)$</p> <p>Area = $\frac{1}{2}(5)(12) - \frac{1}{2}(5)^2(1.1762)$ K1</p> <p>$= 15.2975$ N1</p>	8
6	<p>(a) $2^{4(3x-2)} = \frac{2}{2^{2(x-4)\frac{1}{2}}}$ K1</p> <p>$4(3x-2) = 1 - (x-4)$ K1</p> <p>$x = 1$ N1</p> <p>(b) $\log_5 3.6 = \log_5 \frac{36}{10}$</p> <p>$= \log_5 6^2 - \log_5 10$ K1 K1</p> <p>$= 2(s) - (\log_5 2 + \log_5 5)$</p> <p>$= 2s - r - 1$ N1</p>	6

SECTION B [60 MARKS]		
No.	MARKING SCHEME	Σ MARKS
7	<p>(a) $m = \frac{8-2}{1-4} = -2$ K1</p> <p>$y = -2x + 10$ N1</p> <p>(b) $\text{Area} = \frac{1}{2} \begin{vmatrix} 0 & 1 & 4 & 0 \\ 0 & 8 & 2 & 0 \end{vmatrix} = \frac{1}{2} (1)(2) - (4)(8)$ K1</p> <p>$= 15$ N1</p> <p>(c) $\frac{(2)(4) + (1)(1)}{3}$ K1 K1 $\frac{(2)(2) + (1)(8)}{3}$</p> <p>$R(3, 4)$ N1</p> <p>(d) $\sqrt{(x-4)^2 + (y-2)^2} = 6$ K1 N1</p> <p>$x^2 + y^2 - 8x - 4y - 16 = 0$ N1</p>	10
8	<p>(a) $\frac{2x+3}{4-x} = y$</p> <p>$2x + xy = 4y - 3$ K1</p> <p>$g^{-1}(x) = \frac{px-3}{x+q} = \frac{4x-3}{2+x}$ N1</p> <p>$p = 4$ and $q = 2$ N1</p> <p>(b) $4x + 1 = 2x^2 - x + k$</p> <p>$2x^2 - 5x + k - 1 = 0$ K1</p> <p>$(-5)^2 - 4(2)(k-1) < 0$ K1</p> <p>$k > \frac{33}{8}$ N1</p> <p>(c) $(-1, 5)$ P1</p> <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>P1 max graph</p> <p>P1 (-1,5)</p> <p>P1 two point</p> </div> 	10

No.	MARKING SCHEME	Σ MARKS
9	<p>(a) Refer to the graph 3</p> <p>(b) Mean = $\frac{3(35.5) + 14(45.5) + 34(55.5) + 50(65.5) + 15(75.5) + 4(85.5)}{3 + 14 + 34 + 50 + 15 + 4}$</p> <p style="text-align: right;">K1</p> <p style="text-align: center;">= $\frac{7380}{120}$ (P1 for Σfx = 7380)</p> <p style="text-align: center;">= 61.5 N1</p> <p>(c) P1 for $L_{Q3} = 60.5$ or $F_{Q3} = 51$ or $f_{Q3} = 50$</p> $Q_3 = 60.5 + \left(\frac{\frac{3}{4}(120) - 51}{50} \right) \times 10$ <p style="text-align: center;">= 68.3 N1</p>	10
10	<p>(a) $\frac{dy}{dx} = 4x - 1$ K1</p> <p style="text-align: center;">$\delta y = \frac{dy}{dx} \times \delta x = (4x - 1)(0.01)$ K1</p> <p style="text-align: center;">= 0.19 N1</p> <p>(b) (i) $\frac{dV}{dr} = -2(2 - 3r)^{-2}(-3)$ K1</p> <p style="text-align: center;">= $\frac{6}{(2 - 3r)^2}$ N1</p> <p>(ii) $\frac{dV}{dt} = \frac{dV}{dr} \times \frac{dr}{dt}$</p> <p style="text-align: center;">= $\frac{6}{(2 - 3r)^2} \times 1.5$ K1</p> <p style="text-align: center;">= 9 N1</p> <p>(c) $\frac{dy}{dx} = 2x^3 \cdot 4(5 - 2x)^3(-2) + 6x^2(5 - 2x)^4$ K1 N1</p> <p style="text-align: center;">= $2x^2(5 - 2x)^3[-8x + 3(5 - 2x)]$</p> <p style="text-align: center;">= $2x^2(5 - 2x)^3(15 - 14x)$ N1</p>	10

No. 9

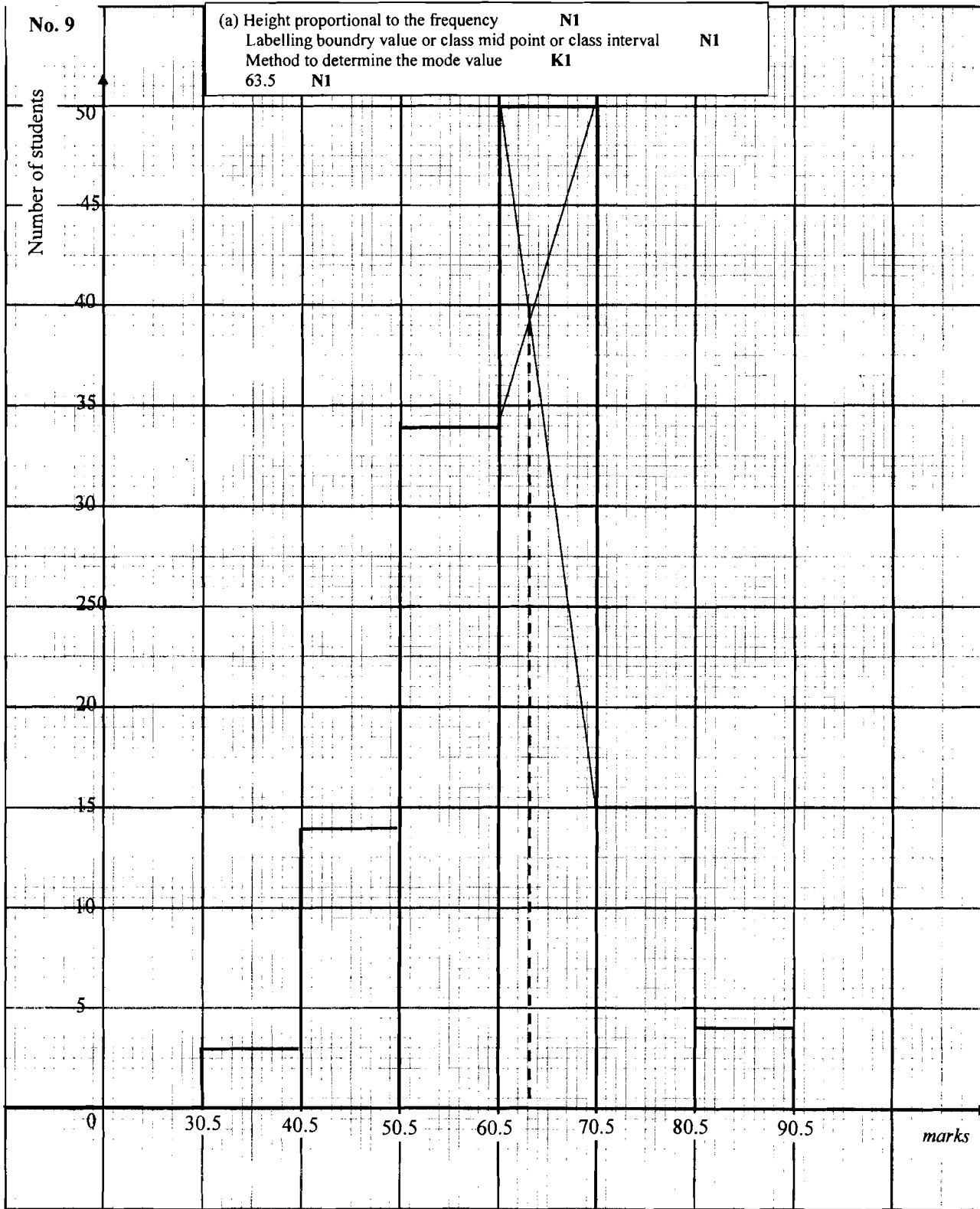
(a) Height proportional to the frequency N1
Labelling boundry value or class mid point or class interval N1
Method to determine the mode value K1
63.5 N1

Number of students

50
45
40
35
30
25
20
15
10
5
0

30.5 40.5 50.5 60.5 70.5 80.5 90.5

marks



No.	MARKING SCHEME	Σ MARKS
11	<p>(a) (i) $\frac{35 \cdot 40}{P_{03}} \times 100 = 125$ K1 $P_{03} = 28.32$ N1</p> <p>(ii) $I_{06,00} = \frac{P_{06}}{P_{00}} \times 100 = \frac{P_{06}}{P_{03}} \times \frac{P_{03}}{P_{00}} \times 100$ K1 $= \frac{130}{100} \times 120$ K1 $= 156$ N1</p> <p>(b) (i) $\frac{135(36)+125(30)+x(10)+130(24)}{100} = 129$ K1 P1 for ΣW $10x = 1170$ $x = 117$ N1</p> <p>(ii) $129 = \frac{25.8}{P_{03}} \times 100$ K1 $= RM 20$ N1</p>	10
12	<p>(a) $\frac{1}{2}(7.5)(4) \sin \theta = 12$ K1 $\theta = 53^\circ 8' = 53.13^\circ$ N1</p> <p>(b) $PR^2 = 7.5^2 + 4^2 - 2(7.5)(4)\cos 53.13^\circ$ K1 $PR = 6.0208$ N1</p> <p>(c) $\frac{\sin Q}{6.0208} = \frac{\sin 30^\circ}{12}$ K1 $\angle PQR = 14.52^\circ = 14^\circ 32'$ N1 $\angle QPR = 135.48^\circ = 135^\circ 28'$ N1</p> <p>(d) $\Delta PSR = \frac{1}{2}(6.0208)(12) \sin 135^\circ 28'$ K1 K1 ΔPSR + 12 quadrilateral $PQRS = 37.3292$ N1</p>	10

No.	MARKING SCHEME	Σ MARKS
13	(a) - 1 P1	10
	(b) $g^{-1}(-2)$ K1	
	12 N1	
	(c) $f(-1) = k(-1) + 1 = -2$ dan/atau $g(12) = \frac{2 + m(12)}{5} = -2$ K1	
	$k = 3$ N1 N1 $m = -1$	
	(d) $\frac{2 - z}{5} = u$ K1	
	$g^{-1}(y) = 2 - 5y$ N1	
(e) $g^{-1}f(x) = 2 - 5(3x + 1)$ K1		
$= -15x - 3$ N1		

END OF MARKING SCHEME