<u>SULIT</u>

3472/1 Additional Mathematics Set 2 (P1) 2010 2 hours

Name:	_
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Class: _____



JABATAN PELAJARAN NEGERI PERAK

GERAK GEMPUR

SIJIL PELAJARAN MALAYSIA 2010

Additional Mathematics

SET 2 (Paper 1)

Two Hours

Question	Full Marks	Marks Obtained	Question	Full Marks	Marks Obtained
1	2		14	2	
2	2		15	4	
3	4		16	3	
4	2		17	3	
5	4		18	3	
6	4		19	4	
7	3		20	3	
8	4		21	4	
9	4		22	3	
10	2		23	4	
11	2		24	4	
12	4		25	3	
13	3		Total Marks	80	

This questions paper consists of 13 printed pages.

INFORMATION FOR CANDIDATES

- 1. This question paper consists of **25** questions.
- 2. Answer **all** questions.
- 3. Give only **one** answer for each question.
- 4. Write your answers clearly in the spaces provided in the question paper.
- 5. Show your working. It may help you to get marks.
- 6. If you wish to change your answer, cross out the work that you have done. Then write down the new answer.
- 7. The diagrams in the questions provided are not drawn to scale unless stated.
- 8. The marks allocated for each question are shown in brackets.
- 9. A list of formulae is provided on pages 4 to 6.
- 10. You may use a non-programmable scientific calculator.
- 11. This question paper must be handed in at the end of the examination.

The following formulae may be useful in answering questions. The symbols given are the ones commonly used.

ALGEBRA

1.
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
2.
$$a^m x a^n = a^{m+n}$$
3.
$$a^m \div d^n = a^{m-n}$$
4.
$$(a^n)^n = a^{nm}$$
5.
$$\log_a mn = \log_a m + \log_a n$$
6.
$$\log_a \frac{m}{n} = \log_a m - \log_a n$$
7.
$$\log_a m^n = n \log_a m$$
12.
$$S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$$
13.
$$S_\infty = \frac{a}{1 - r}, |r| < 1$$
CALCULUS
1.
$$y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$
4. Area under a curve
$$= \int_a^b y \, dx \text{ or } = \int_a^b x \, dy$$
2.
$$y = \frac{u}{v}, \frac{dy}{du} = \frac{v \frac{du}{du}}{v^2}$$
5. Volume generated
3.
$$\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$= \int_a^b \pi y^2 \, dx \text{ or } = \int_a^b \pi y^2 \, dx \text{ or } = \int_a^b \pi x^2 \, dy$$

GEOMETRY

4.

1. Distance=
$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Area of triangle

$$= \frac{1}{2} |(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)|$$

2. Midpoint $(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ 5. $|\underline{r}| = \sqrt{x^2 + y^2}$

Midpoint
$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right) 5.$$
 $|\underline{r}| = \sqrt{x^2 + y^2}$

a segment of a line
$$6$$
.

$$\hat{r} = \frac{x\underline{i} + y\underline{j}}{\sqrt{x^2 + y^2}}$$

$$(x, y) = \left(\frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n}\right)$$

STATISTICS

1.
$$\overline{x} = \frac{\sum x}{N}$$

2.
$$\overline{x} = \frac{\sum fx}{\sum f}$$

3.
$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{N}} = \sqrt{\frac{\sum x^2}{N} - \bar{x}^2}$$

4.
$$\sigma = \sqrt{\frac{\sum f(x-x)^2}{\sum f}} = \sqrt{\frac{\sum fx^2}{\sum f} - x^2}$$

5.
$$m = L + \left(\frac{\frac{1}{2}N - F}{f_m}\right)C$$

6.
$$I = \frac{Q_1}{Q_0} \ge 100$$

7.
$$\overline{I} = \frac{\sum IW}{\sum W}$$

8.
$$\overline{I} = \frac{\sum W_i I_i}{\sum W_i}$$
9.
$${}^{n}P_r = \frac{n!}{(n-r)!}$$
10.
$${}^{n}C_r = \frac{n!}{(n-r)!r!}$$
11.
$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$
12.
$$P(X = r) = {}^{n}C_r p^r q^{n-r}, p+q = 1$$
13. Mean, $\mu = np$

14.
$$\sigma = \sqrt{npq}$$

15.
$$Z = \frac{X - \mu}{\sigma}$$

TRIGONOMETRY

1. Arc length,
$$s = r\theta$$

2. Area of sector, $A = \frac{1}{2}r^2\theta$
3. $\sin^2 A + \cos^2 A = 1$
4. $\sec^2 A = 1 + \tan^2 A$

5.
$$\csc^2 A = 1 + \cot^2 A$$
 12

6.
$$\sin 2A = 2 \sin A \cos A$$

7.
$$\cos 2A = \cos^2 A - \sin^2 A$$
$$= 2\cos^2 A - 1$$
$$= 1 - 2\sin^2 A$$

8.
$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

9.
$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

10.
$$\tan (A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$
$$2 \tan A$$

11.
$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

12.
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

13.
$$a^2 = b^2 + c^2 - 2bc \cos A$$

14. Area of triangle =
$$\frac{1}{2}ab\sin C$$



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Answer **all** the questions. [80 marks]





- Determine (a) $g^{-1}(2)$,
- (b) *gf*(3).

[2	marks
14	marks



(b)_____

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3. Function f is defined as $f: x \to 2x + k$. Given that $f^{2}(4) = 1$. Find (a) the value of k

(b) thus, the function f^{-1} .

[4 marks]

Answer: (a)

(b)_____

4. Form a quadratic equation which has equal roots of $\frac{1}{2}$. [2 marks]

Answer: _____

5. Given that the graph of quadratic function $f(x)=2x^2 + bx + 8$ always lies above the *x*-axis. Find the range of values of *b*. [4 marks]

Answer:	 	
11.000000000000000000000000000000000000	 	

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6. Diagram 6 shows the graph of the function $y = -(x + 1)^2 + 9$, where *m* is a constant. The curve touches y = m at point *A* and cut the *y*-axis at point B. The curve also cut the *x*-axis at point P.





- (a) Determine the value of *m* and *k*.
- (b) State the coordinates of point P.

[4 marks]

Answer: (a) m = ..., k = ...

(b)

7. Solve the equation

$$8^x \div 4^{\frac{1}{2}x-1} = 64$$

[3 marks]

Answer:.....

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8. Solve the equation

$$\log_2 x - \log_4 (x - 4) = 2$$

[4 marks]

Answer:....

9 Diagram 9 shows part of a straight line graph drawn to represent equation cx + dy = xy where *c* and *d* are constant.



Diagram 9

Find the value of c and d.

[4 marks]

Answers c =

d =

SULIT

10. Diagram 10 shows three triangles formed by match sticks. The length of each match stick is 4 cm.



Diagram 10

The perimeters of the triangle form an arithmetic progression. The terms of the progression are in ascending order.

(a) Write down the first three terms of the progression.

(b) Find the common difference of the progression.

[2 marks]

Answer: (a) _____

(b)_____

11. Given the geometric progression 49, 21, 9, Find the sum to infinity of the progression. [2 marks]

Answer:

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12. Diagram 12 shows a circle of radius 2.5 cm. The area of the shaded region is 6.25 cm². Calculate the perimeter of the shaded region. [4 marks]



Answer:

13. In diagram 13, *MN* is parallel to *BC* and 2*MN*=*BC* It is given that $\overrightarrow{AB} = \overrightarrow{BC} = \underline{a}$ and $\overrightarrow{AD} = \underline{a} + \underline{b}$.



Express, as simply as possible in term of \underline{a} and/or \underline{b} ,

(a) \overrightarrow{DB}

- (b) \overrightarrow{DC}
- (c) \overrightarrow{NM}

[3 marks]

Answer:	(a)	••	•	••	•	••	•	•	•••	• •	•	•	• •	•	•	•	•	•	•	•	•

(b).....

(c)

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[2 marks]

14. Given that $\underline{a} = 3\mathbf{i} + \mathbf{j}$ and $\underline{b} = -6\mathbf{i} + \mathbf{j}$.

Express
$$2\underline{a} - \frac{1}{3}\underline{b}$$
 in the form $x\mathbf{i} + y\mathbf{j}$.

Answer:

15. Diagram 15 shows a kite ABCD.





- (a) the midpoint of diagonal AC.
- (b) the equation of diagonal BD

[4 marks]

Answer: (a)

(b).....

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16. Solve equation $2 \sin x \cos x = \sin x$ for $0^{\circ} < x < 360^{\circ}$

[3 marks]

- 17. Given that $\cos A = m$ where A is an acute angle, express each of the following in terms of m.
 - (a) $\tan A$
 - (b) sec 2*A*

[3 marks]

Answer: (a)

(b)

18. Find the value of constant m if

 $\int_{-\infty}^{\infty} (4x+m)dx = 1 \qquad [3 \text{ marks}]$

Answer: $m = \dots$

19. The gradient function of a curve is $\frac{dy}{dx} = kx - 3x^2$, where *k* is a constant. It is given that the curve has a turning point at $x = \frac{2}{3}$ and the curve passes through point (1, 2).

Find

- (a) the value of k,
- (b) the equation of the curve.

[4 marks]

Answer: (a)

(b)

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- 20. Given that $y = 2x^3 4x^2$,
 - (a) find the value of dy when x = 1,
 - dx
 - (b) express the approximate change in y, in term of k, when x changes from 1 to 1 + k, where k is a small positive value. State whether this is an increase or decrease.

[4 marks]

Answer: (a)

(b) approximate change in $y = \dots$

(Increase / decrease) Underline the correct answer

21. Diagram 21 shows part of curve y=f(x) which passes through the point (0, *a*) and (7, 7).



Given that the area of the shaded region is 13 unit², find the value of $\int_{0}^{7} f(x) dx$

[2 marks]

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Answer:

- 22. A committee of 8 people is to be selected from 7 teachers and 6 students. Find the number of different ways in which the committee can be selected if(a) there are no restrictions,
 - (b) there are 5 teachers and 3 students in the committee. [3 marks]

Answer: (a)

(b)

23. A biased coin is tossed three times. On each occasion the probability of getting a head is 0.6. Find the probability of getting(a) three heads,

(b) only one head.

[3 marks]

Answer: (a)

(b)

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24. The heights, in cm, of 5 starting players in a basketball team are 168, 170, 172, 175, 180.

Find the (a) average height and ,

(b) standard deviation of these heights.

[4 marks]

Answer: (a)

(b)

25. Diagram 25 shows a probability distribution graph of a continuous random variable x that is normally distribution with a mean of 22 and standard deviation of 2.

[3 marks]



Find the area of the shaded region.

Answer:

END OF QUESTION PAPER

SULIT

INFORMATION FOR CANDIDATES MAKLUMAT UNTUK CALON

- 1. This question paper consists of 25 questions. *Kertas soalan ini mengandungi 25 soalan.*
- 2. Answer all questions. *Jawab semua soalan.*
- 1. Write your answers in the spaces provided in the question paper. *Tulis jawapan anda dalam ruang yang disediakan dalam kertas soalan.*
- 2. Show your working. It may help you to get marks. *Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.*
- 3. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer. *Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat.*
- 4. The diagrams in the questions provided are not drawn to scale unless stated. *Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
- 5. The marks allocated for each question are shown in brackets. *Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.*
- 6. A list of formulae is provided on pages 3 to 5. Satu senarai rumus disediakan di halaman 3 hingga 5.
- 7. A normal distribution table is inserted in page 2. *Satu jadual taburan normal disediakan di halaman 2.*
- 8. You may use a non-programmable scientific calculator. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
- 9. Hand in this question paper to the invigilator at the end of the examination. *Serahkan kertas soalan ini kepada pengawas peperiksaan di akhir peperiksaan.*

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3472/2 Additional Mathematics Set 2 2010 2 ½ hours Name: _____

Class: _____



JABATAN PELAJARAN NEGERI PERAK

GERAK GEMPUR

SIJIL PELAJARAN MALAYSIA 2010

Additional Mathematics

SET 2 (Paper 2)

Two Hours Thirty Minutes

Section	Question	Full Marks	Marks Obtained
Ocolion	1	5	
	2	8	
•	3	8	
A	4	5	
	5	8	
	6	6	
	7	10	
Р	8	10	
В	9	10	
	10	10	
	11	10	
C	12	10	
C	13	10	
	14	10	
Т	otal	100	

SECTION A

[40 marks]

Answer all questions in this section

1. Solve the simultaneous equations

$$x + 3y = 13$$

 $x^2 + 3y^2 = 43$ [5 marks]

- 2. The curve $y = -x^2 + 2x + 8$ cut the *x*-axis at points P(*h*, 0) and Q(*k*, 0) where *k*>*h*. (a) Find
 - (i) the value of h and k,
 - (ii) the range of x if $-x^2 + 2x + 8 > 0$ [5 marks]
 - (b) Using the values of *h* and *k* in (a) (i)(i) State the axis of symmetry of the curve
 - (ii) Find the maximum value of *y*. [3 marks]
- 3. Given that the curve $y = ax^2 + \frac{b}{x}$ has gradient 4 at point (1, 5). (a) Find the value of *a* and *b*. [5 marks]
 - (b) The equation of normal to the curve at point (1, 5). Giving your answer in general form [3 marks]
- 4. (a) Sketch the graph of $y = \sin 2x$ for $0 < x < 2\pi$. [2 marks]
 - (b) In order to solve the equation $8x + 5\pi \sin 2x = 5\pi$ another straight line must be added to your diagram in (a).
 - (i) Write down the equation of this line and add this line to your diagram in (a).
 - (ii) State the number of values of x which satisfy the equation $8x + 5\pi \sin 2x = 5\pi$ for $0 < x < 2\pi$. [3 marks]

5. Diagram 5, $\overrightarrow{AD} = \underline{p}$ and $\overrightarrow{AB} = \underline{q}$. Given that DE:EB = 1:2 and BC is parallel to AD such that BC = kAD, where k is a constant.



6. Kamal open a saving account with a bank on 1st of January. His initial savings amount (principal) is RM 1500. He plans not to make any withdrawal in the coming 16 years. The following table shows how his investment grows at the end of the first three years.

End of	The amount of money in saving account (RM)
first year	1590
second year	1685.4
third year	1786.524

Kamal's saving continues to grow in this way for the subsequent years.

- (a) The amount of money at the end of n-th year forms a geometry progression. State the common ratio. [1 marks]
- (b) Find the amount of money he have at the end of sixth year. [2 marks]
- (c) Calculate the number of years that it would take for Kamal's saving to exceed RM 3000. [3 marks]

SECTION B

[40 *marks*]

Answer four questions from this section.

7. Diagram 7 shows part of the curve $y = (x^2 - 4)(1-2x)$. The curve has a maximum point at A and a minimum point at B.



- (a) Find the *x*-coordinate of the point *A* and of the point *B*. [5]
- (b) Find the area of the shaded region.
- 8. Use graph paper to answer this question. Table 8 shows experimental values of the variables x and y which are related by the equation $y = \frac{a}{x^2} + \frac{b}{x}$, where *a* and *b* are constants.

x	2	4	6	8	10		
У	6.24	2.82	1.79	1.33	1.05		

Table 8

(a) Based on Table 8, construct a table for the value of x and x^2y . [2 marks]

(b) Plot x^2y against x using scale of 1 cm to 1 unit on x-axis and 1 cm to 5 unit on x^2y –axis.

Hence draw the line of best fit. [3 marks]

(c) Use your graph in 8(b) to estimate the value of (i) *a* (ii) *b*. [5 marks]

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[5]

9. Diagram 9 shows a parallelogram with vertices *A*(-2, 1), *B*(8, 1), *C*(6, 9) and *D*. *DEF* is a straight line. The point *F* is such that *EF* is parallel to *AB*.



(a) (i) state the coordinates of D

(ii). equation of straight line passes through A and parallel to BD [4 marks]

- (b) Given that $DE = \frac{1}{4}DB$. Find the coordinates of *E*. [2 marks]
- (c) The area of trapezium *AEFB* is 1½ x (the area of parallelogram *ABCD*). Find the coordinates of *F*. [4 marks]

10 Diagram 10 shows a semicircle *OABCD* with centre *O* and a right angled triangle *ADE*..



It is given that the length of $AE = 10 \ cm$ and the radius of the semicircle *OABCD* is 6 cm.

[Use $\pi = 3.142$]

Calculate

(a) $\angle EDA$ in radian,	[2 marks]
(b) (i) the length, in cm, of the arc AB ,	[2 marks]
(ii) the perimeter, in cm, of the shaded region,	[3 marks]
(c) the area, in cm^2 , of the segment <i>BCD</i> .	[3 marks]

- 11. (a) In a certain school of big population, 60% of the students have internet connection at home. Ten students are chosen at random from that school. If X represents the number of students from this sample of 10 students that has internet connection at home, calculate
 - (i) the probability that at least 2 students have internet connection at home.
 - (ii) the mean and standard deviation of the distribution.

[5 marks]

- (b) The masses of students in a school has a normal distribution with a mean μ kg and a standard deviation 12 kg.
 - (i) A student is chosen at random from the school. The probability that the student has a mass less than 45 kg is 0.2266, find the value of μ .
 - (ii) Hence, calculate the probability that a student chosen at random will have a mass between 42 kg and 45 kg.

[5 marks]

SECTION C

[20 *marks*]

Answer two questions from this section.

12 *A*, *B*, *C* and *D* are four points on level ground with *B* due east of *A*. It is given that AC = 55 m, CD = 25 m, AD = 70 m, $\angle CAB = 50^{\circ}$ and $\angle ABC = 48^{\circ}$.



(a) Calculate	
(i) AB	[2 marks]
(ii) ∠CAD	[3 marks]
(iii) Area of triangle ABC	[2 marks]

(b) A man walks along *AB* from A until he reaches a point P which is equidistant from *A* and *C*. Calculate the distance *AP*. [3 marks]

[3 marks]

13. Table 13 shows the prices, the price indices and weightages of four type of monthly expenses P, Q, R and S

Ingredients	Price () l for th	RM) per kg ne year	Price index for the Year 2009 based	Weightage
	2007	2009	on the year 2007	
Р	2.25	2.70	x	3
Q	4.50	6.75	150	5
R	у	1.35	112.5	8
S	2	2.10	105	2



- (a) Find the value of x and of y.
- (b) Calculate the composite index for monthly expenses in the year 2009 based on the year 2007. [3 marks]
- (c) The composite index for the cost of total monthly expenses increases by 20% from the year 2009 to the year 2010. Calculate
 - (i) the composite index for the monthly expenses in the year 2010 based on the year 2007
 - (ii) the total monthly expenses the year 2010 if its corresponding monthly expenses in the year 2007 is RM 278 [4 marks]
- 14. Use graph paper to answer this question.

A furniture company launches two new models of sofa, type P sofa and type Q sofa. The cost of producing each type P sofa is RM 600 and each type Q sofa is RM 800.The production of sofa is based on the following constraints:

- I : The total weekly production cost is limited to RM 48000.
- II : The total number of sofas that the company can produce in a week is at least 15.
- III : The number of type P sofa produced is not more than twice the number of type Q sofa.

If the company produces x set of type P sofa and y set of type Q sofa,

- (a) Write down three inequalities, other than x≥0 and y≥0, which satisfy all the above constraints. [3 marks]
- (b) Using a scale of 2 cm to represent 10 set of sofa on both axes, construct and shade the region R that satisfies all the above constraints. [3 marks]

(c) The profit made on each type P and type Q sofa is RM 300 and RM 350 respectively. How should the company arrange production of each type of sofa in a week in order to maximize the profit? State the maximum profit.

[4 marks]

- 15. A particle moves in a straight line so that, *t* seconds after passing through a fixed point *O*, its velocity, $v \text{ ms}^{-1}$, is given by $v = 8 + 2t t^2$ Find
 - (a) the initial acceleration in ms^{-2} , of the particle. [2 marks]
 - (b) the value of t at the instants when the magnitude of the acceleration is 1 m s^{-2} [3 marks]
 - (c) the distance of the particle from *O* when the particle comes to instantaneous rest. [5 marks]

END OF QUESTION PAPER

INFORMATION FOR CANDIDATES MAKLUMAT UNTUK CALON

1. This question paper consists of three sections: Section A, Section B and Section C.

Kertas soalan ini mengandungi tiga bahagian: **Bahagian A**, **Bahagian B** dan **Bahagian C**.

2. Answer all questions in Section A, any four questions from Section B and any two questions from Section C.

Jawab semua soalan dalam Bahagian A, mana-mana empat soalan daripada Bahagian B dan mana-mana dua soalan daripada Bahagian C.

3. Write your answers on the 'buku jawapan' provided. If the 'buku jawapan' is insufficient, you may ask for 'helaian tambahan' from the invigilator.

Jawapan anda hendaklah ditulis di dalam buku jawapan yang disediakan. Sekiranya buku jawapan tidak mencukupi, sila dapatkan helaian tambahan daripada pengawas peperiksaan.

- 4. Show your working. It may help you to get marks. *Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.*
- 5. The diagrams in the questions provided are not drawn to scale unless stated. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
- 6. The marks allocated for each question and sub-part of a question are shown in brackets.

Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.

- A list of formulae is provided on pages 3 to 5.
 Satu senarai rumus disediakan di halaman 3 hingga 5.
- 8. Graph paper and a booklet of four-figure mathematical tables is provided. Kertas graf dan sebuah buku sifir matematik empat angka disediakan.
- 9. You may use a non-programmable scientific calculator. Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.
- 10. Tie the 'helaian tambahan' and the graph papers together with the 'buku jawapan' and hand in to the invigilator at the end of the examination.

Ikat helaian tambahan dan kertas graf bersama-sama dengan buku jawapan dan serahkan kepada pengawas peperiksaan pada akhir peperiksaan.



GERAK GEMPUR SPM 2010 ANJURAN JABATAN PELAJARAN PERAK

ADDITIONAL MATHEMATICS

PAPER 1 (SET 2)

Time: Two hours

MARK SCHEME

1.	(a) 1, 4		[1]	
	(b) $1 \le h(\mathbf{x}) \le 5$		[1]	
2.	(a) 10	[1]		
	(b) 2	[1]		
3.	(a) $f(4)=8+k$ $f^{2}(4)=16+3k$ k=-5			[1] [1] [1]
	(b) $f^{-1}(x) = (x+5)/4$	4		[1]
4.	$(2x-1)^2=0$ or equation $4x^2-4x+1=0$	valent n	nethod	[1] [1]
5.	use $b^2 - 4ac < 0$ $b^2 - 4(2)(8) < 0$ (b-8)(b+8) < 0 -8 < b < 8		[B1] [B2] [B4]	
6.	(a) $m = 9$, $k = 8$.		[1, 1]	
	(b) Factorize (-4, 0)		[1] [1]	
7.	change to base 2 3x-(x-2) = 6 x=2	[1] [1] [1]		
8.	change to base 2 Use logarithm law Solve equation Value <i>x</i> =8		[1] [1] [1] [1]	

9. linear form Comparing intercept and g c = 1.5 d = -0.5	[1] gradient [1] [1] [1]			
10. (a) 12, 24, 36 (b) 12	[1] [1]			
11. Use formula of S_{∞} 85.75	[1] [1]			
12. Use $\frac{1}{2} r^2 \theta = 6.25$ [1] $\theta = 2 rad$ [1]				
Perimeter = $2r + r \theta = 2(2.5) + (2.5)(2)$ =10 cm				
13. (a) – <u>b</u>	[1]			
(b) $\underline{a} - \underline{b}$	[1]			
(c) $-\frac{1}{2} \underline{a}$	[1]			
14. correct substitution $8\underline{i} + (5/3)\underline{j}$	[1] [1]			
15. (a) (1, 9)	[1]			
(b) $m = -\frac{1}{2}$ $y-9=-\frac{1}{2}(x-1)$ 2y = -x + 19	[1] [1] [1]			
16. $\sin x(2 \cos x - 1) = 0$ $\sin x = 0$ $\cos x$ $x = 60^{\circ}, 180^{\circ}, 300^{\circ}$	$ = \frac{1}{2} $ [1] [1] [1]			
17. (a) $\frac{\sqrt{1-m^2}}{2}$				

(a)
$$\frac{\sqrt{1-m^2}}{m}$$
 [1]
(b) $\frac{1}{\cos 2A} = \frac{1}{2\cos^2 A - 1}$ [1]
 $\frac{1}{2m^2 - 1}$ [1]

18. Integrate[1]Substitution[1]Value, m = -5[1]

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[1] [1]

19. (a) substitute
$$x=2/3$$
 in dy/dx=0 [1]
 $k=2$ [1]

(b) Integrate,
$$y = x^2 - x^3 + c$$
 [1]
Substitute (1, 2)
 $y = x^2 - x^3 + 2$ [1]

20. (a)
$$dy/dx = 6x^2 - 8x$$
. [1]
= -2 [1]

$$\begin{array}{c} \text{(b)} -2k & [1]\\ \text{Decrease} & [1] \end{array}$$

22. (a) ${}^{13}C_8 = 1287$ [1]

(b))
$${}^{7}C_{5} \times {}^{6}C_{3}$$
 [1]
= 420 [1]

23. (a) $(0.6)^3$ =0.216 [1]

(b)
$${}^{3}C_{1} (0.6)(0.4)^{2}$$
 [1]
= 0.288 [1]

24. (a) 173 cm [1] (b) $\Sigma(x-\text{mean})^2 = 88 \text{ or } \Sigma x^2 = 149733$ [1] Substitution in std dev formula [1] Value= 4.195 [1]

25. P(1 <z<2)< th=""><th>[1]</th></z<2)<>	[1]
= 0.9772 - 0.8413	[1]
= 0.1359	[1]



GERAK GEMPUR SPM 2010 ANJURAN JABATAN PELAJARAN PERAK

ADDITIONAL MATHEMATICS PAPER 2 (SET 2) Time: Two hours thirty minutes

MARK SCHEME

x = 13 - 3y [P1] $(13 - 3y)^{2} + 3y^{2} = 43$ [K1] $(or x^{2} + \frac{(13 - x)^{2}}{3} = 43)$ $6(2y^{2} - 13y + 21) = 0$ $(or 2(2x^{2} - 13x + 20) = 0)$ (2y - 7)(y - 3) = 0 (or (2x - 5)(x - 4) = 0 [K1] $y = 3 \text{ or } \frac{7}{2} \left(x = \frac{5}{2} \text{ or } 4 \right)$ [N1, N1] $(or x = 4 \text{ or } \frac{5}{2} \left(y = \frac{7}{2} \text{ or } 3 \right))$

1.

- 2. (a) (i) (x+2)(-x+4)=0 [K1] Factorize or using formula h = -2, k = 4 [N1, 1]
 - (ii) sketch graph and shade the correct region (or other valid method) [K1] -2 < x < 4 [N1]
 - (b) x = 1 [P1] Substitute x = 1 in $y = -x^2 + 2x + 8$ [K1] $y_{max} = 9$ [N1]
- 3. (a) 5 = a + b Substitute (1, 5) on curve. [K1] $dy/dx = 2ax - b/x^2$ [K1] 2a - b = 4 [K1] a=3, b=2 [N1,1]
 - (b) gradient of normal -1/4 [P1] Forming equation [K1] Equation : x + 4y - 21 = 0 [N1]



4 (a) [P2] Graph of $y = \sin 2x$: sinusoidal shape with correct domain and range.

8 (a)

x	2	4	6	8	10
x^2y	24.96	45.12	64.44	85.12	105

[N2]





³ http://chngtuition.blogspot.com

(c) Calculates gradient K1 Value of gradient N1 Equates intercept to a OR Equates gradient to to b K1 $b = 10 \pm 0.4$ N1 $a = 5 \pm 2$ **N1** 9. (a) (i) (-4, 9)N1 (ii) Gradient of BD = -2/3P1 Forming equation of parallel line K1 Equation 2x+3y+1=0N1 (b) Method for E K1 (-1,7)N1 (c) Find area trapezium = $1.5 \times 80 = 120 \text{ K1}$ Height trapezium = 6**P**1 Form relation 3k + 33 = 120K1 F (29, 7) N1 10. (a) $\tan \angle EDA = 10/12$ K1 $\angle EDA = 0.6947$ rad **N1** (b) (i) 6 x (0.6948 x 2) K1 = 8.337 cm N1 (ii) $\cos (0.6948 \text{ rad}) = \text{BD}/12 \text{ or } \text{ED} = \sqrt{(10^2 + 12^2)} \text{ K1}$ Perimeter = 10+8.337+(15.62-9.218)K1 = 24.74 cm N1 (c) $\angle BCD = 3.142 - 0.6948 \times 2 = 1.7524$ **P**1 $\frac{1}{2} \times 6^2 \times (1.7524 - \sin 1.7524)$ K1 $= 13.84 \text{ cm}^2$ N1 11. (a) (i) $1-P(X \ge 2) = 1 - {}^{10}C_1(0.6)^1 (0.4)^9 - (0.4)^{10}$ K1 = 0.9983N1 (ii) use mean = np or std dev= $\sqrt{[np(1-p)]}$ K1 N1 mean = 6std dev= 1.549N1 (b) (i) P(Z<-0.75)=0.2266 **P1** $(45-\mu)/12=-0.75$ K1 $\mu = 54$ N1 (ii) P(42 < X < 45) = P(-1 < Z < -0.75)= 0.2266 - 0.1379K1 = 0.0887N1

12. (a) (i) Apply sine rule K1
AB= 73.3 m N1
(ii) Apply cosine rule K1
Cos
$$\angle$$
CAD = 0.948 K1
 \angle CAD = 18.5° N1
(iii) $\frac{1}{2}$ (55)(73.3)sin 50 K1
= 1544.15 m² N1

(b)
$$\angle CPA = 80^{\circ}$$
 P1
Apply sine rule cosine rule K1
= 42.8 m N1

13. (a)
$$x = \frac{RM 2.70}{RM 2.25} \times 100 = 120$$
 N1

$$y = \frac{100}{112.5} \times RM1.35$$
 K1
= RM 1.20 N1

(b)
$$\frac{(120 \times 15) + (150 \times 25) + (112.5 \times 40) + (105 \times 20)}{100}$$
 [K1]
= $\frac{12150}{100}$ [1]
= 121.5 [N1]

(c) (i)
$$\overline{I}_{2010/2007} = \overline{I}_{2009/2007} \times \frac{120}{100}$$

= 121.5 × $\frac{120}{100}$ [K1]
= 145.8 [N1]

(ii)
$$P_{2010} = \frac{145.8}{100} \times RM278$$
 [K1]

$$=$$
 RM 405.324 [N1]

⁵ http://chngtuition.blogspot.com



 $s = 26\frac{2}{3}$ m [1] [N1, N1, N1]