

Name :

Form :

PROGRAM PENINGKATAN PRESTASI AKADEMIK SPM 2011
ADDITIONAL MATHEMATICS

Kertas 1
Ogos 2011
2 jam

Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis nama dan tingkatan anda pada ruangan yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

<i>Untuk Kegunaan Pemeriksa</i>		
Soalan	Markah Penuh	Markah Diperolehi
1	2	
2	3	
3	4	
4	3	
5	3	
6	3	
7	3	
8	3	
9	2	
10	3	
11	3	
12	3	
13	3	
14	4	
15	2	
16	3	
17	4	
18	4	
19	3	
20	4	
21	4	
22	3	
23	3	
24	4	
25	4	
TOTAL	80	

Kertas soalan ini mengandungi 20 halaman bercetak

Answer **all** questions.
Jawab semua soalan.

- 1 Diagram 1 shows the relation between set A and set B .
Rajah 1 menunjukkan hubungan antara set A dan set B .

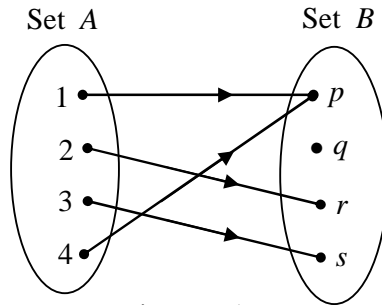


Diagram 1

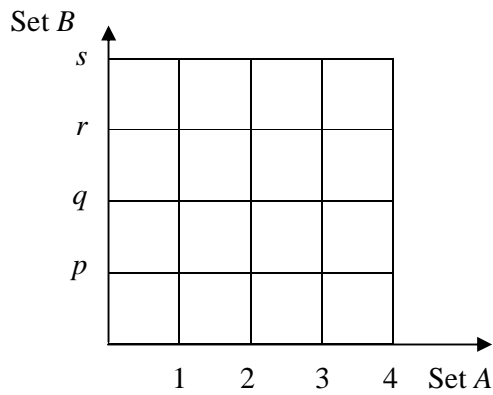
Rajah 1

- (a) Plot the relation in the graph form,
Plotkan hubungan itu dalam bentuk graf,
- (b) State the type of the relation .
Nyatakan jenis hubungan itu .

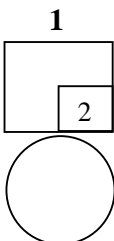
[2 marks]
[2 markah]

Answer/*Jawapan:*

- (a)



- (b)



2 Given the function $h: x \rightarrow |3x - 5|$.

Diberi fungsi $h: x \rightarrow |3x - 5|$.

Find

Cari

- (a) the image of -2 ,
imej bagi -2 ,
- (b) the values of x such that $h(x) = 4$.
nilai-nilai x dengan keadaan $h(x) = 4$.

[3 marks]
[3 markah]

Answer/Jawapan:

(a)

(b)

2

3

3 Given the function $h(x) = 2 + 3x$ and $k(x) = px - 15$, find

Diberi fungsi $h(x) = 2 + 3x$ dan $k(x) = px - 15$, cari

- (a) $h^{-1}(7)$,
- (b) the value of p such that $kh(4) = 13$.
nilai bagi p dengan keadaan $kh(4) = 13$.

[4 marks]
[4 markah]

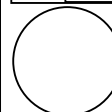
Answer/Jawapan:

(a)

(b)

3

4



4 Diagram 4 shows the graph of the function $f(x) = 2(x - p)^2 - 5$.

Rajah 4 menunjukkan graf bagi fungsi $f(x) = 2(x - p)^2 - 5$.

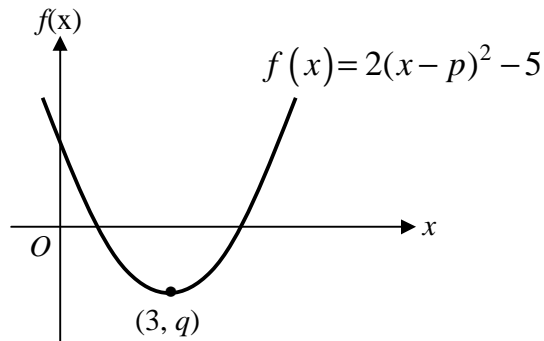


Diagram 4
Rajah 4

The curve has the minimum point $(3, q)$.

Lengkung tersebut mempunyai titik minimum $(3, q)$.

State

Nyatakan

- (a) the value of p ,
nilai bagi p ,
- (b) the value of q ,
nilai bagi q ,
- (c) the equation of the axis of symmetry.
persamaan bagi paksi simetri.

[3 marks]

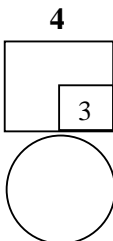
[3 markah]

Answer/Jawapan:

(a)

(b)

(c)



- 5 Given that α and β are the roots of the quadratic equation $2x^2 + 5x + k = 0$, where k is a constant.

Diberi α dan β adalah punca-punca bagi persamaan kuadratik $2x^2 + 5x + k = 0$, dengan keadaan k ialah pemalar.

Find

Cari

- (a) the value of $\alpha + \beta$,
nilai bagi $\alpha + \beta$,
- (b) the value of k such that $\alpha\beta = 3$.
nilai bagi k dengan keadaan $\alpha\beta = 3$.

[3 marks]

[3 markah]

Answer/Jawapan:

(a)

(b)

5



- 6 Find the range of values of x for which $4x^2 \geq 3 - 4x$.

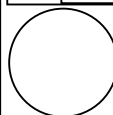
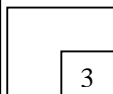
[3 marks]

Cari julat nilai-nilai x bagi $4x^2 \geq 3 - 4x$.

[3 markah]

Answer/Jawapan:

6



- 7** Solve the equation :
Selesaikan persamaan :

$$2^x = 5(2^{x+1}) - 144$$

[3 marks]
[3 markah]

Answer/Jawapan:

7

3

-
- 8** Solve the equation $\log_5 x = 1 + \log_5(x - 4)$.

[3 marks]

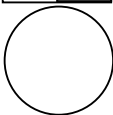
Selesaikan persamaan $\log_5 x = 1 + \log_5(x - 4)$.

[3 markah]

Answer/Jawapan:

8

3



- 9 The n^{th} term of an arithmetic progression is given by $T_n = 11 - 3n$. Find the common difference of the progression.

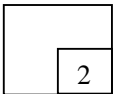
Diberi sebutan ke- n bagi suatu jangjang aritmetik ialah $T_n = 11 - 3n$. Cari beza sepunya bagi jangjang ini.

[2 marks]

[2 markah]

Answer/Jawapan:

9



-
- 10 Given that 12, 6, 3, ... is a geometric progression, find the sum of the first 7 terms after the 3rd term of the progression.

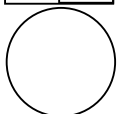
Diberi 12, 6, 3, ... ialah suatu jangjang geometri, cari hasil tambah 7 sebutan pertama selepas sebutan ke-3.

[3 marks]

[3 markah]

Answer/Jawapan:

10



11 Given $0.471 + 0.000471 + 0.000000471 + \dots = \frac{P}{333}$. Find the value of p .

Diberi $0.471 + 0.000471 + 0.000000471 + \dots = \frac{P}{333}$. Cari nilai bagi p .

[3 marks]
[3 markah]

Answer/Jawapan:

11



12 Diagram 12 shows the straight line graph obtained by plotting $\log_{10} y$ against $\log_{10} x$.
Rajah 12 menunjukkan graf garis lurus yang diperolehi dengan memplot $\log_{10} y$ melawan $\log_{10} x$.

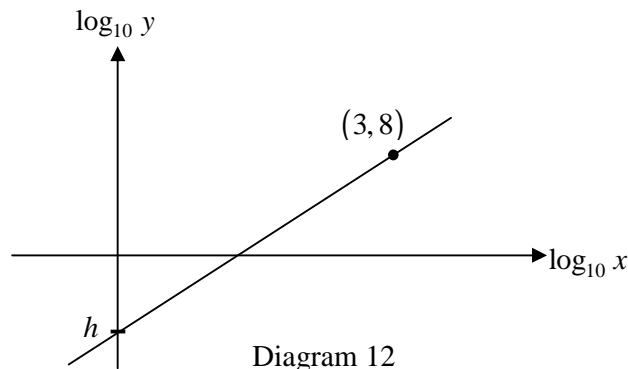


Diagram 12
Rajah 12

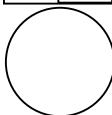
The variables x and y are related by the equation $y = \frac{x^k}{10}$ where k is a constant. Find the value of h and of k .

Pembolehubah x dan y dihubungkan oleh persamaan $y = \frac{x^k}{10}$, dengan keadaan k ialah pemalar. Cari nilai h dan nilai k .

[3 marks]
[3 markah]

Answer/Jawapan:

12



- 13 Find the equation of a straight line that passes through the point (5, 3) and perpendicular to the straight line $2y - 4x = 7$.

Cari suatu persamaan garis lurus yang melalui titik (5, 3) dan berserenjang dengan garis lurus $2y - 4x = 7$.

[3 marks]

[3 markah]

Answer/Jawapan:

13

3

-
- 14 Given points $A(k, 3k)$, $B(-2, 1)$ and $C(3, 2)$. Find the values of k if the area of the triangle ABC is $10 \cdot 5$ unit².

Diberi titik $A(k, 3k)$, $B(-2, 1)$ dan $C(3, 2)$. Cari nilai-nilai bagi k jika luas segi tiga ABC ialah $10 \cdot 5$ unit².

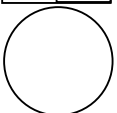
[4 marks]

[4 markah]

Answer/Jawapan:

14

4



15 Diagram 15 shows two vectors, \overline{OA} and \overline{OB} .

Rajah 15 menunjukkan dua vektor, \overline{OA} dan \overline{OB} .

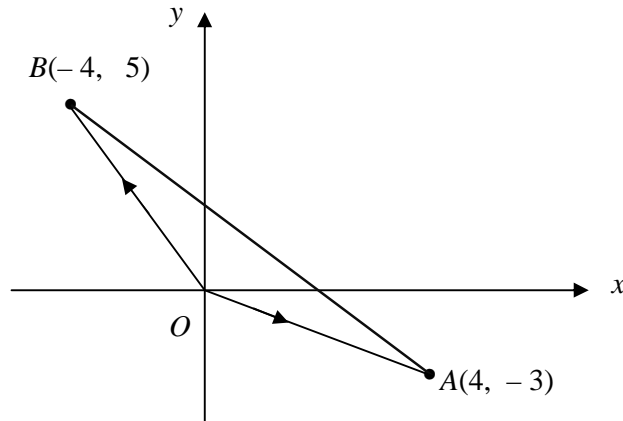


Diagram 15
Rajah 15

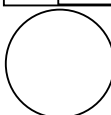
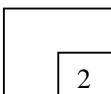
Express \overline{BA} in the form $x\underline{i} + y\underline{j}$.

Ungkapkan \overline{BA} dalam bentuk $x\underline{i} + y\underline{j}$.

[2 marks]
[2 markah]

Answer/Jawapan:

15



16

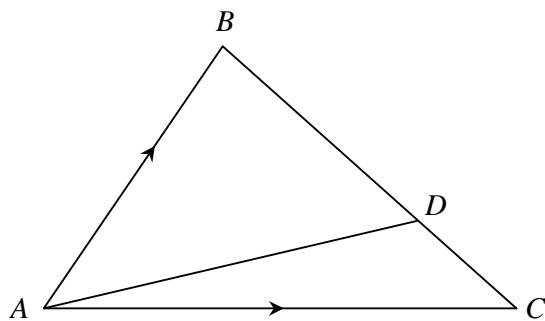


Diagram 16
Rajah 16

Diagram 16 shows a triangle ABC and D is a point on BC . Given $\overrightarrow{AB} = 3\mathbf{i} + 7\mathbf{j}$, $\overrightarrow{AC} = 11\mathbf{i} + 3\mathbf{j}$ and $BD = 3DC$, find \overrightarrow{AD} .

Rajah 16 menunjukkan segi tiga ABC dan D ialah satu titik pada BC . Diberi $\overrightarrow{AB} = 3\mathbf{i} + 7\mathbf{j}$, $\overrightarrow{AC} = 11\mathbf{i} + 3\mathbf{j}$ dan $BD = 3DC$, cari \overrightarrow{AD} .

[3 marks]

[3 markah]

Answer/Jawapan:

16

3

17

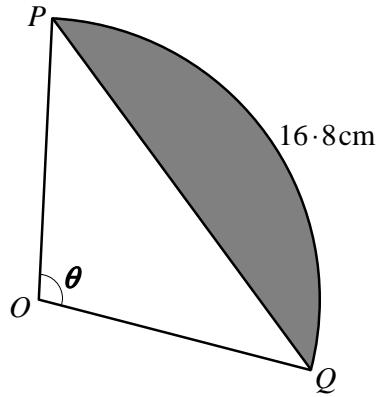


Diagram 17
Rajah 17

Diagram 17 shows a sector OPQ of a circle with centre O and radius of 7 cm. Given the length of the arc PQ is 16.8 cm.
Rajah 17 menunjukkan sektor OPQ bagi sebuah bulatan berpusat O dan jejari 7 cm. Diberi panjang lengkok PQ ialah 16.8 cm.

Find
Cari

- (a) the value of θ in radians,
nilai bagi θ dalam radian,
- (b) the area, in cm^2 , of the shaded region.
luas, dalam cm^2 , kawasan berlorek.

[4 marks]
[4 markah]

Answer/Jawapan:

(a)

(b)

17

4

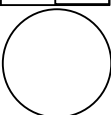
18 Solve the equation $3\sin 2x = 2\cos x$ for $0^\circ \leq x \leq 360^\circ$.
Selesaikan persamaan $3\sin 2x = 2\cos x$ bagi $0^\circ \leq x \leq 360^\circ$.

[4 marks]
[4 markah]

Answer/Jawapan:

18

4



19 Given $\int_1^3 f(x)dx = 5$ and $\int_3^1 g(x)dx = 2$. Find the value of $\int_1^3 [2f(x) - g(x)]dx$.

Diberi $\int_1^3 f(x)dx = 5$ dan $\int_3^1 g(x)dx = 2$. Cari nilai $\int_1^3 [2f(x) - g(x)]dx$.

[3 marks]

[3 markah]

Answer/Jawapan:

19

3

20 It is given that $y = \frac{2x+1}{x-3}$, $x \neq 3$.

Diberi bahawa $y = \frac{2x+1}{x-3}$, $x \neq 3$.

Find
Cari

(a) the value of $\frac{dy}{dx}$ when $x = 4$,

nilai bagi $\frac{dy}{dx}$ apabila $x = 4$,

(b) the approximate change in y when x increases from 4 to 4.01 .
perubahan kecil bagi y apabila x bertambah dari 4 kepada 4.01 .

[4 marks]

[4 markah]

Answer/Jawapan:

(a)

(b)

20

4

- 21** Point A lies on the curve $y = 2x^4 - x$, find the coordinates of point A where the gradient of the normal at point A is $-\frac{1}{7}$.

Titik A terletak pada lengkung $y = 2x^4 - x$, cari koordinat bagi titik A dengan keadaan kecerunan normal pada titik A ialah $-\frac{1}{7}$.

[4 marks]

[4 markah]

Answer/Jawapan:

21

4

- 22** The standard deviation of a set of six numbers is $\sqrt{15}$. Given that the sum of square for the set of numbers is 144. Find the new mean when a number 10 is added to this set.

Sisihan piawai bagi satu set yang terdiri daripada enam nombor ialah $\sqrt{15}$. Diberi bahawa hasil tambah kuasa dua bagi nombor-nombor tersebut ialah 144. Cari min baru apabila satu nombor 10 ditambah kepada set ini.

[3 marks]

[3 markah]

Answer/Jawapan:

22

3

- 23 Diagram 23 shows 3 letters and 4 digits.
Rajah 23 menunjukkan 3 huruf dan 4 angka.

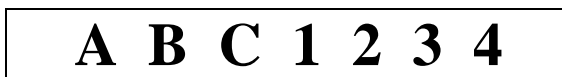


Diagram 23
Rajah 23

A code is to be formed using those letters and digits. The code must consist of 2 letters followed by 3 digits. How many codes can be formed if no letter or digit is repeated in each code?

Satu kod dibentuk menggunakan huruf-huruf dan angka-angka berkenaan. Kod ini mesti menggunakan 2 huruf dan diikuti dengan 3 angka. Berapa kod yang boleh dibentuk dengan tiada huruf dan angka yang berulang?

[3 marks]
[3 markah]

Answer/Jawapan:

23

	3
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- 24 In an athletic championship, the probability that an athlete is being chosen to take part in the 100 m event is $\frac{3}{7}$ and in the 800 m event is $\frac{2}{5}$.

Dalam satu kejohanan olahraga, kebarangkalian bahawa seorang peserta dipilih untuk mengambil bahagian dalam acara 100 m ialah $\frac{3}{7}$ dan acara 800 m ialah $\frac{2}{5}$.

Find the probability that the athlete will be chosen to take part in
Cari kebarangkalian peserta itu dipilih untuk mengambil bahagian dalam

- (a) both the events,
kedua-dua acara,
- (b) at least one event.
sekurang-kurangnya satu acara.

[4 marks]
[4 markah]

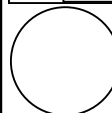
Answer/Jawapan:

(a)

(b)

24

	4
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- 25** The random variable X is normally distributed with a mean of 62 and a standard deviation of 3.

Pembolehubah rawak X bertaburan normal dengan min 62 dan sisihan piawai 3.

Find the value of
Cari nilai bagi

- (a) $P(X > 65)$,
- (b) k if $P(X > k) = 0.6915$.
k jika $P(X > k) = 0.6915$.

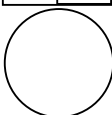
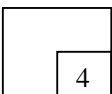
[4 marks]
[4 markah]

Answer/Jawapan:

(a)

(b)

25



END OF QUESTION PAPER
KERTAS SOALAN TAMAT