

SULIT**3472/1****3472/1****Matematik
Tambahan
Kertas 1
September
2007**

2 jam

MAKTAB RENDAH SAINS MARA**PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2007****MATEMATIK TAMBAHAN**

Kertas 1

Dua jam

**BUKA KERTAS SOALAN INI SEHINGGA
DIBERITAHU**

1. *Tuliskan nama dan kelas anda pada ruang yang disediakan.*
2. *Kertas soalan ini adalah dalam dwibahasa.*
3. *Soalan di halaman kiri adalah dalam bahasa Inggeris. Soalan di halaman kanan adalah yang sepadan dalam bahasa Malaysia.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Malaysia atau bahasa Inggeris.*
5. *Calon dikehendaki membaca arahan di halaman 2 dan halaman 3.*

Soalan	Markah Penuh	Markah Diperoleh
1	2	
2	3	
3	3	
4	3	
5	3	
6	4	
7	4	
8	3	
9	4	
10	4	
11	3	
12	3	
13	4	
14	2	
15	4	
16	3	
17	3	
18	4	
19	2	
20	3	
21	3	
22	4	
23	3	
24	3	
25	3	
Jumlah		

Kertas soalan ini mengandungi 27 halaman bercetak dan 1 halaman tidak bercetak

3472/1**SULIT**

SULIT

3472/1

For
Examiner's
Use

Answer **all** questions

1 Diagram 1 shows the function $f : x \rightarrow y$.

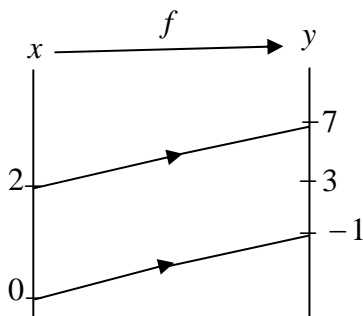


DIAGRAM 1

State

- (a) the domain,
 - (b) the range,
- of the function.

[2 marks]

1

2

Answer: (a).....

(b).....

2 It is given that $g^{-1} : x \rightarrow x + 4$ and $f : x \rightarrow (3 - x)^2$.

Find

- (a) g ,
- (b) fg .

[3 marks]

2

3

Answer: (a).....

(b).....

3472/1

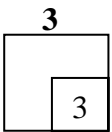
SULIT

SULIT**3472/1**

For
Examiner's
Use

- 3** Solve the quadratic equation $4x^2 - 9 = (2x + 1)(x - 3)$.
Give your answer correct to three significant figures.

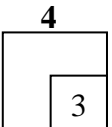
[3 marks]



Answer :

- 4** Find the range of the values of x for $(x + 1)(x - 2) \geq 2(x + 4)$.

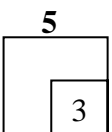
[3 marks]



Answer :

- 5** Solve the equation $8 \times 4^{a+1} = 16^{2a}$.

[3 marks]

**3472/1****SULIT**

SULIT


3472/1

For
Examiner's
Use

Answer :

6 Solve the equation $\log_3 4x + 3\log_3 2 - \log_3(6 - x) = 1$.


[4 marks]

6


Answer :

7 Express the equation $\log_4 y - \log_{16} \sqrt{x} = 3$ in the form $y = ax^b$, where a and b are constants.

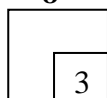
[4 marks]

7


Answer :

8 The sum of the first n terms of an arithmetic progression, S_n , is given by $S_n = 5n^2 - 3n$. Find the 5th term of the progression.

[3 marks]

8


Answer :

3472/1

SULIT

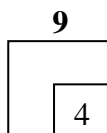
SULIT

3472/1

For
Examiner's
Use

- 9** For a geometric progression, the sum of the first two terms is 30 and the third term exceeds the first term by 15. Find the common ratio and the first term of the geometric progression.

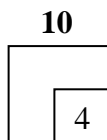
[4 marks]



Answer:

- 10** It is given that $p = 0.160606... = 0.1 + q$, where q is a recurring decimal. Express p as a fraction in its simplest form.

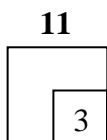
[4 marks]



Answer:

- 11** Given that the straight line $py + x + 5 = 0$ is perpendicular to the straight line $2y - q^2x = 6$, where p and q are constants, find the relation between p and q .

[3 marks]



Answer:

3472/1

SULIT

For
Examiner's
Use

12 Diagram 2 shows the graph of xy against x^2 .

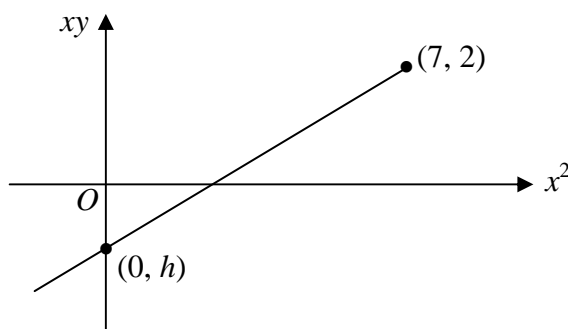


DIAGRAM 2

The variables x and y are related by the equation $2y = x + \frac{k}{x}$, where k is a constant.

Find the value of h and of k .

[3 marks]

Answer : $h = \dots\dots\dots$

$k = \dots\dots\dots$

12

3

13 Diagram 3 shows a triangle OAB , where O is the origin.

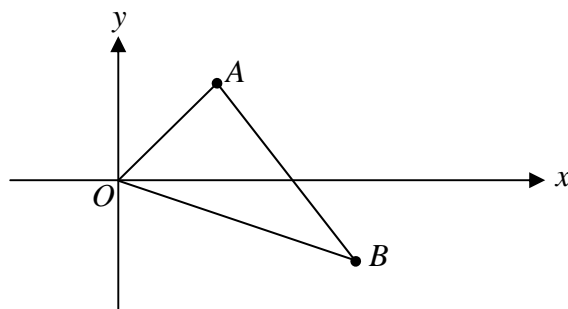


DIAGRAM 3

It is given that the coordinates of point A and point B are $(3,4)$ and $(5,-2)$ respectively.

Find

(a) \overrightarrow{AB} ,

(b) the possible unit vectors parallel to \overrightarrow{OA} .

[4 marks]

13

4

Answer : (a) $\dots\dots\dots$

SULIT

3472/1

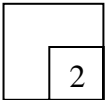
For
Examiner's
Use

(b).....

14 It is given that \vec{a} and \vec{b} are non-parallel vector. If $(m - 1) \vec{a} = (n + 2) \vec{b}$, where m and n are constants, find the value of m and of n .

[2 marks]

14



Answer:

15 Diagram 4 shows the sector POQ of a circle centre O and radius 10 cm.

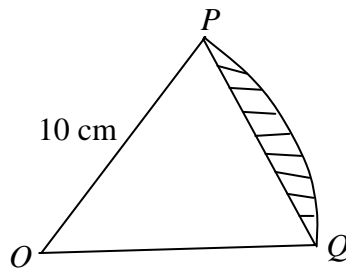
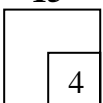


DIAGRAM 4

It is given that the length of the chord PQ is 12 cm. Find the area, in cm^2 , of the shaded segment.

[4 marks]

15



Answer:

3472/1

SULIT

SULIT**3472/1**For
Examiner's
Use

16 Solve the equation $2 \sin \theta + 3 \cos \theta = 0$ for $0^\circ \leq \theta \leq 360^\circ$.

[3 marks]

16

3

Answer :

17 If $f(t) = \frac{3t^2 + 4}{5 - 2t}$, find $f'(t)$.

[3 marks]

17

3

Answer:

18 Find the coordinates of the turning points of the curve $y = 12 - x^3 - \frac{48}{x}$.

[4 marks]

18

4

Answer:

3472/1**SULIT**

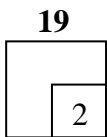
SULIT

3472/1

For
Examiner's
Use

19 Given that $\int_1^3 f(x)dx = 5$, find the value of $\int_3^1 [f(x) - 7]dx$.

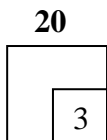
[2 marks]



Answer:

20 Given that $\frac{d}{dx} \left(\frac{x^2 - 1}{2x + 1} \right) = 2f(x)$, find the value of $\int_0^2 f(x)dx$.

[3 marks]



Answer:

21 Diagram 5 shows part of the curve $y = (x - 2)(6 - x)$.

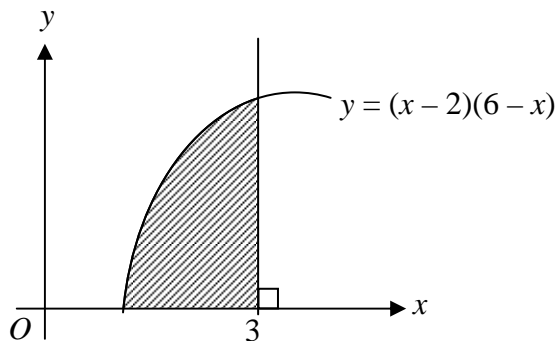
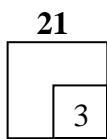


DIAGRAM 5

Find the area of the shaded region.

[3 marks]



Answer:

3472/1

SULIT

SULIT

3472/1

For
Examiner's
Use

22 Diagram 6 shows nine letter cards to be arranged in a row.

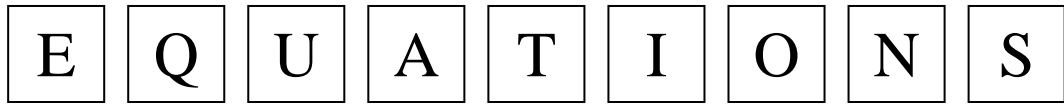


DIAGRAM 6

Calculate the number of different arrangements of all the letter cards if

- (a) the arrangement start with vowel,
- (b) all the consonants must be together.

[4 marks]

22



Answer : (a).....

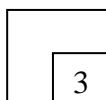
(b).....

23 A quiz team consists of 6 students. These students are to be chosen from 20 students. Calculate the number of different ways the team can be formed if

- (a) there is no restriction,
- (b) 2 particular students must be chosen.

[3 marks]

23



Answer :(a).....

(b).....

3472/1

SULIT

SULIT

3472/1

For
Examiner's
Use

24 A bag contains 8 cards where 3 of the cards are yellow. Three cards are drawn at random from the bag, one after the other without replacement. Calculate the probability that at least two yellow cards are drawn.

[3 marks]

24
3

Answer:

25 The diameters of the marbles produced by a factory are normally distributed with a mean of 9 mm and a standard deviation of 0.1 mm. Diagram 7 shows the normal distribution graph for the diameter of the marbles, X mm.

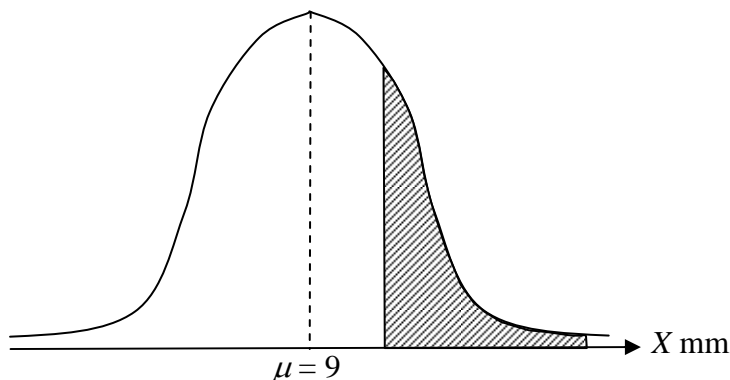


DIAGRAM 7

It is given that the area of the shaded region is 0.4522. Find the value of h .

[3 marks]

25
3

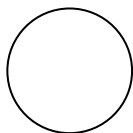
Answer :

SULIT

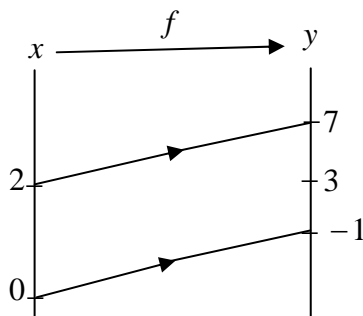
3472/1

END OF QUESTION PAPER
Jawab semua soalan

*Untuk
 Kegunaan
 Pemeriksa*



1 Rajah 1 menunjukkan fungsi $f : x \rightarrow y$.



RAJAH 1

Nyatakan

- (a) domain,
- (b) julat,

bagi fungsi tersebut.

[2 markah]

Jawapan : (a).....

(b).....

1

2

2 Diberi bahawa $g^{-1} : x \rightarrow x + 4$ dan $f : x \rightarrow (3 - x)^2$.

Cari

- (a) g ,
- (b) fg .

[3 markah]

Jawapan : (a)

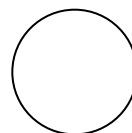
(b).....

2

3

3472/1

SULIT



SULIT**3472/1***Untuk
Kegunaan
Pemeriksaan*

- 3 Selesaikan persamaan kuadratik $4x^2 - 9 = (2x + 1)(x - 3)$. Berikan jawapan anda betul kepada tiga angka bererti.

[3 markah]

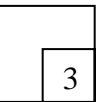
Jawapan:

3

- 6 Cari julat nilai x bagi $(x + 1)(x - 2) \geq 2(x + 4)$.

[3 markah]

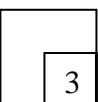
Jawapan :

4

- 7 Selesaikan persamaan $8 \times 4^{a+1} = 16^{2a}$.

[3 markah]

Jawapan :

5**3472/1****SULIT**

SULIT

3472/1

Untuk
Kegunaan
Pemeriksaan

6 Selesaikan persamaan $\log_3 4x + 3\log_3 2 - \log_3 (6 - x) = 1$.

[4 markah]

Jawapan :.....

6
3

7 Ungkapkan persamaan $\log_4 y - \log_{16} \sqrt{x} = 3$ dalam bentuk $y = ax^b$, dengan keadaan a dan b ialah pemalar.

[4 markah]

Jawapan :

7
4

8 Hasil tambah n sebutan pertama suatu jangjang aritmetik, S_n , diberi oleh $S_n = 5n^2 - 3n$. Cari sebutan ke-5 jangjang itu.

[3 markah]

Jawapan :

8
3

3472/1

SULIT

SULIT

3472/1

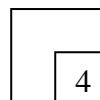
Untuk
Kegunaan
Pemerik.

- 10** Bagi suatu janjang geometri, hasil tambah dua sebutan pertama ialah 30 dan sebutan ketiga melebihi sebutan pertama sebanyak 15. Cari nisbah sepunya dan sebutan pertama bagi janjang geometri itu.

[4 markah]

Jawapan :

9



- 13** Diberi bahawa $p = 0.160606... = 0.1 + q$, dengan keadaan q ialah nombor perpuluhan jadi semula. Ungkapkan p dalam bentuk pecahan termudah.

[4 markah]

Jawapan :

10

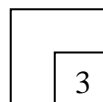


- 14** Diberi garis lurus $py + x + 5 = 0$ adalah berserenjang dengan garis lurus $2y - q^2x = 6$, dengan keadaan p dan q ialah pemalar, cari hubungan antara p dan q .

[3 markah]

Jawapan :

11



3472/1

SULIT

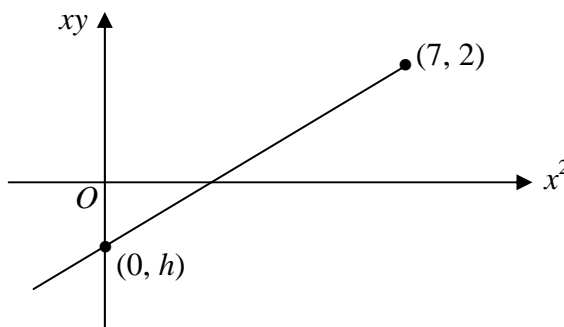


SULIT

3472/1

Untuk
Kegunaan
Pemeriks

15 Rajah 2 menunjukkan graf xy melawan x^2 .



RAJAH 2

Pembolehubah-pembolehubah x dan y dihubungkan oleh persamaan $2y = x + \frac{k}{x}$, dengan keadaan k ialah pemalar. Cari nilai h dan nilai k .

[3 markah]

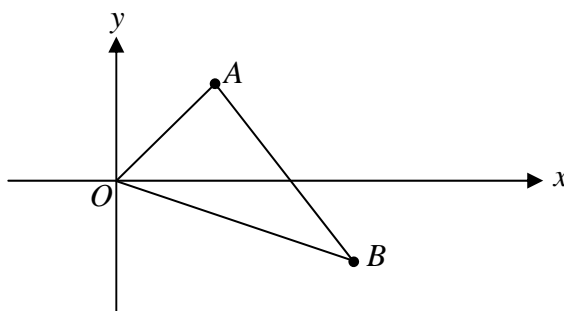
Jawapan : $h = \dots\dots\dots$

$k = \dots\dots\dots$

12

3

13 Rajah 3 menunjukkan segitiga OAB , dengan keadaan O ialah asalan.



RAJAH 3

Diberi bahawa koordinat-koordinat bagi titik A dan titik B masing-masing ialah $(3,4)$ dan $(5,-2)$.

Cari

(a) \overline{AB} ,

(b) vektor-vektor unit yang selari dengan \overrightarrow{OA} .

[4 markah]

Jawapan : (a) $\dots\dots\dots$

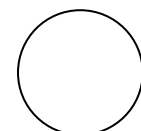
(b) $\dots\dots\dots$

13

4

3472/1

SULIT



SULIT

3472/1

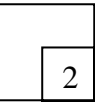
Untuk
Kegunaan
Pemeriksaan

- 14** Diberi bahawa a dan b adalah vector-vektor yang tidak selari.
Jika $(m - 1)\vec{a} = (n + 2)\vec{b}$, dengan keadaan m dan n ialah pemalar, cari nilai m dan nilai n .

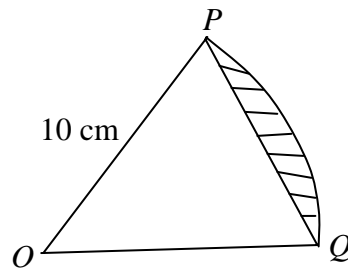
[2 markah]

Jawapan :.....

14



- 17** Rajah 4 menunjukkan sector POQ bagi sebuah bulatan berpusat O dan jejari 10 cm.



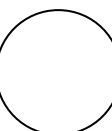
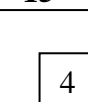
RAJAH 4

Diberi bahawa panjang perentas PQ ialah 12 cm. Cari luas, dalam cm^2 , tembereng berlorek.

[4 markah]

Jawapan:

15



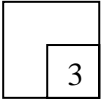
3472/1

SULIT

SULIT**3472/1**Untuk
Kegunaan
Pemeriksaan**18** Selesaikan persamaan $2 \sin \theta + 3 \cos \theta = 0$ bagi $0^\circ \leq \theta \leq 360^\circ$.

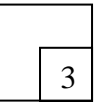
[3 markah]

Jawapan :

16**21** Jika $f(t) = \frac{3t^2 + 4}{5 - 2t}$, cari $f'(t)$.

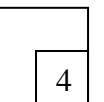
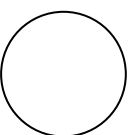
[3 markah]

Jawapan :

17**22** Cari koordinat-koordinat titik-titik pusingan lengkung $y = 12 - x^3 - \frac{48}{x}$.

[4 markah]

Jawapan :

18**3472/1****SULIT**

SULIT

3472/1

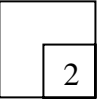
Untuk
Kegunaan
Pemeriksaan

23 Diberi $\int_1^3 f(x)dx = 5$, cari nilai bagi $\int_3^1 [f(x) - 7]dx$.

[2 markah]

Jawapan :

19

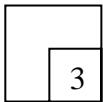


24 Diberi $\frac{d}{dx} \left(\frac{x^2 - 1}{2x + 1} \right) = 2f(x)$, cari nilai bagi $\int_0^2 f(x)dx$.

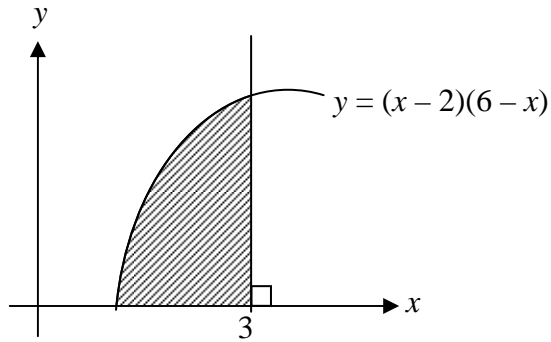
[3 markah]

Jawapan :

20



26 Rajah 5 menunjukkan sebahagian daripada lengkung $y = (x - 2)(6 - x)$.



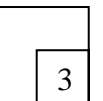
RAJAH 5

Cari luas rantau berlorek.

[3 markah]

Jawapan :

21



3472/1

SULIT

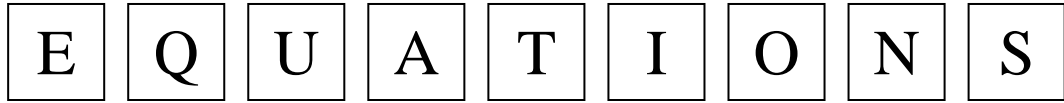


SULIT

3472/1

*Untuk
Kegunaan
Pemeriksaan*

27 Rajah 6 menunjukkan sembilan keping kad huruf yang hendak disusun dalam satu baris.



RAJAH 6

Hitung bilangan susunan yang berlainan bagi semua kad itu jika

- (c) susunan bermula dengan vokal,
- (d) semua konsonan mesti bersama.

[4 markah]

Jawapan : (a).....
(b).....

22

4

28 Satu pasukan kuiz terdiri daripada 6 orang pelajar. Pelajar- pelajar itu akan dipilih daripada 20 orang pelajar. Hitung bilangan cara yang berlainan pasukan itu boleh di bentuk jika

- (a) tiada syarat dikenakan,
- (b) 2 orang pelajar tertentu mesti dipilih.

[3 markah]

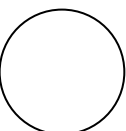
Jawapan :(a).....
(b).....

23

3

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SULIT



SULIT

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Untuk
Kegunaan
Pemeriksaan

- 29** Sebuah beg mengandungi 8 keping kad dengan keadaan 3 keping daripada kad itu adalah berwarna kuning. Tiga keping kad dikeluarkan secara rawak daripada beg itu, secara berturut-turut tanpa dikembalikan. Hitung kebarangkalian bahawa sekurang-kurangnya dua keping kad berwarna kuning dikeluarkan.

[3 markah]

Jawapan :

24
3

- 30** Diameter guli yang dihasilkan oleh sebuah kilang adalah bertaburan secara normal dengan min 9 mm dan sisihan piawai 0.1 mm. Rajah 7 menunjukkan graf taburan normal bagi diameter guli itu, X mm.

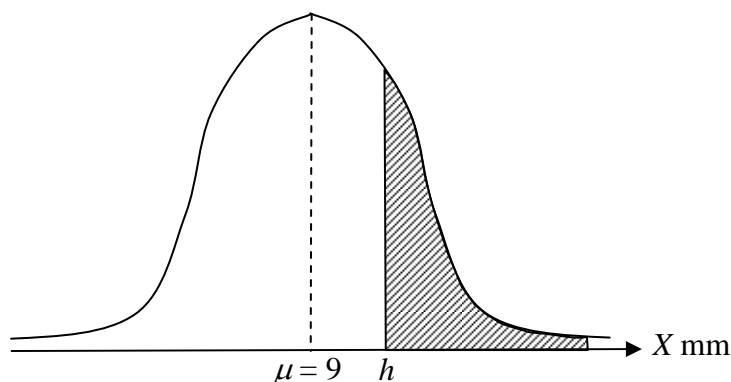


DIAGRAM 7

Diberi bahawa luas kawasan berlorek ialah 0.4522. Cari nilai h .

[3 markah]

Jawapan :

25
3

KERTAS SOALAN TAMAT

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SULIT

