3472/1
ADDITIONAL MATHEMATICS
KERTAS 1
OKTOBER 2020
2 JAM

NO KAD PENGENALAN

						-			-				

Nama Pelajar :.....

Tingkatan :.....

MAJLIS PENGETUA SEKOLAH MALAYSIA (MPSM)
(CAWANGAN KELANTAN)

PEPERIKSAAN
PERCUBAAN SPM
TINGKATAN 5
2020

ADDITIONAL MATHEMATICS
KERTAS 1
MASA : DUA JAM

1. *Tulis* **nombor kad pengenalan** *anda pada petak yang disediakan.*
2. *Kertas 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.*

UNTUK KEGUNAAN GURU		
Soalan	Markah Penuh	Markah Diperoleh
1	3	
2	3	
3	2	
4	4	
5	3	
6	3	
7	3	
8	3	
9	2	
10	3	
11	3	
12	4	
13	2	
14	2	
15	3	
16	2	
17	4	
18	4	
19	4	
20	3	
21	4	
22	4	
23	4	
24	4	
25	4	
Jumlah	80	

Kertas soalan ini mengandungi **30** halaman bercetak

ALGEBRA

1 $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

2 $a^m \times a^n = a^{m+n}$

3 $a^m \div a^n = a^{m-n}$

4 $(a^m)^n = a^{mn}$

5 $\log_a mn = \log_a m + \log_a n$

6 $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

7 $\log_a m^n = n \log_a m$

8 $\log_a b = \dfrac{\log_c b}{\log_c a}$

9 $T_n = a + (n-1)d$

10 $S_n = \dfrac{n}{2}[2a + (n-1)d]$

11 $T_n = ar^{n-1}$

12 $S_n = \dfrac{a(r^n - 1)}{r - 1} = \dfrac{a(1 - r^n)}{1 - r}, \; r \neq 1$

13 $S_\infty = \dfrac{a}{1 - r}, \; |r| < 1$

CALCULUS
KALKULUS

1 $y = uv, \; \dfrac{dy}{dx} = u\dfrac{dv}{dx} + v\dfrac{du}{dx}$

2 $y = \dfrac{u}{v}, \; \dfrac{dy}{dx} = \dfrac{v\dfrac{du}{dx} - u\dfrac{dv}{dx}}{v^2}$

3 $\dfrac{dy}{dx} = \dfrac{dy}{du} \times \dfrac{du}{dx}$

4 Area under a curve
Luas di bawah lengkung

$= \int_a^b y \; dx$ or (*atau*)

$= \int_a^b x \; dy$

5 Volume of revolution
Isipadu kisaran

$= \int_a^b \pi y^2 \; dx$ or (*atau*)

$= \int_a^b \pi x^2 \; dy$

STATISTICS
STATISTIK

1 $\bar{x} = \dfrac{\sum x}{N}$

2 $\bar{x} = \dfrac{\sum fx}{\sum f}$

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

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

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

6 $I = \dfrac{Q_1}{Q_0} \times 100$

7 $\bar{I} = \dfrac{\sum W_i I_i}{\sum W_i}$

8 ${}^nP_r = \dfrac{n!}{(n-r)!}$

9 ${}^nC_r = \dfrac{n!}{(n-r)!r!}$

10 $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

11 $P(X = r) = {}^nC_r p^r q^{n-r}, \; p + q = 1$

12 Mean / *Min*, $\mu = np$

13 $\sigma = \sqrt{npq}$

14 $Z = \dfrac{X - \mu}{\sigma}$

GEOMETRY
GEOMETRI

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

2 Midpoint / *Titik tengah*
$(x, y) = \left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2} \right)$

3 A point dividing a segment of a line
Titik yang membahagi suatu tembereng garis
$(x, y) = \left(\dfrac{nx_1 + mx_2}{m+n}, \dfrac{ny_1 + my_2}{m+n} \right)$

4 Area of triangle / *Luas segi tiga*
$= \dfrac{1}{2} \left| (x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3) \right|$

5 $|\mathbf{r}| = \sqrt{x^2 + y^2}$

6 $\hat{\mathbf{r}} = \dfrac{x\mathbf{i} + y\mathbf{j}}{\sqrt{x^2 + y^2}}$

TRIGONOMETRY
TRIGONOMETRI

1 Arc length, $s = r\theta$
Panjang lengkok, $s = j\theta$

2 Area of sector, $A = \frac{1}{2}r^2\theta$
Luas sector, $L = \frac{1}{2}j^2\theta$

3 $\sin^2 A + \cos^2 A = 1$
$\sin^2 A + \text{kos}^2 A = 1$

4 $\sec^2 A = 1 + \tan^2 A$
$\text{sek}^2 A = 1 + \tan^2 A$

5 $\text{cos ec}^2 A = 1 + \cot^2 A$
$\text{kosek}^2 A = 1 + \text{kot}^2 A$

6 $\sin 2A = 2\sin A\cos A$
$\sin 2A = 2\sin A\,\text{kos}\,A$

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

$\text{kos}\,2A = \text{kos}^2 A - \sin^2 A$
$= 2\,\text{kos}^2 A - 1$
$= 1 - 2\sin^2 A$

8 $\tan 2A = \frac{2\tan A}{1 - \tan^2 A}$

9 $\sin(A \pm B) = \sin A\cos B \pm \cos A\sin B$
$\sin(A \pm B) = \sin A\,\text{kos}\,B \pm \text{kos}\,A\sin B$

10 $\cos(A \pm B) = \cos A\cos B \mp \sin A\sin B$
$\text{kos}(A \pm B) = \text{kos}\,A\,\text{kos}\,B \mp \sin A\sin B$

11 $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A\tan B}$

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

13 $a^2 = b^2 + c^2 - 2bc\cos A$
$a^2 = b^2 + c^2 - 2bc\,\text{kos}\,A$

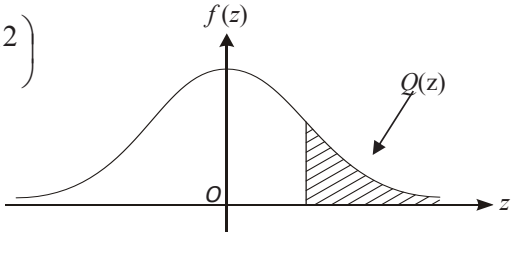
14 Area of triangle / *Luas segi tiga*
$= \frac{1}{2}ab\sin C$

THE UPPER TAIL PROBABILITY Q(z) FOR THE NORMAL DISTRIBUTION N(0,1)
***KEBARANGKALIAN HUJUNG ATAS Q*(z) *BAGI TABURAN NORMAL* N(0, 1)**

z	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											Minus / *Tolak*								
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859	4	8	12	15	19	23	27	31	35
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483	4	7	11	15	19	22	26	30	34
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121	4	7	11	15	18	22	25	29	32
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776	3	7	10	14	17	20	24	27	31
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451	3	7	10	13	16	19	23	26	29
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148	3	6	9	12	15	18	21	24	27
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867	3	5	8	11	14	16	19	22	25
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611	3	5	8	10	13	15	18	20	23
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379	2	5	7	9	12	14	16	19	21
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170	2	4	6	8	10	12	14	16	18
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985	2	4	6	7	9	11	13	15	17
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823	2	3	5	6	8	10	11	13	14
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	1	3	4	6	7	8	10	11	13
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	1	2	4	5	6	7	8	10	11
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	..0475	0.0465	0.0455	1	2	3	4	5	6	7	8	9
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	1	2	3	4	4	5	6	7	8
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	1	1	2	3	4	4	5	6	6
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	1	1	2	2	3	4	4	5	5
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	0	1	1	2	2	3	3	4	4
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	0	1	1	2	2	2	3	3	4
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	0	1	1	1	2	2	2	3	3
2.3	0.0107	0.0104	0.0102								0	1	1	1	1	2	2	2	2
				0.00990	0.00964	0.00939	0.00914				3	5	8	10	13	15	18	20	23
								0.00889	0.00866	0.00842	2	5	7	9	12	14	16	16	21
2.4	0.00820	0.00798	0.00776	0.00755	0.00734						2	4	6	8	11	13	15	17	19
						0.00714	0.00695	0.00676	0.00657	0.00639	2	4	6	7	9	11	13	15	17
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480	2	3	5	6	8	9	11	12	14
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357	1	2	3	5	6	7	9	9	10
2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264	1	2	3	4	5	6	7	8	9
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193	1	1	2	3	4	4	5	6	6
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139	0	1	1	2	2	3	3	4	4
3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100	0	1	1	2	2	2	3	3	4

$$f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$$

$$Q(z) = \int_k^{\infty} f(z)\, dz$$



Example / *Contoh*:

If $X \sim N(0, 1)$, then $P(X > k) = Q(k)$

Jika $X \sim \mathrm{N}(0, 1)$, *maka* $P(X > k) = Q(k)$

*Jawab **semua** soalan.*

1 Given $\log_x p - \frac{1}{\log_q x^2} = 0$. Express *p* in term of *q*.

Diberi $\log_x p - \frac{1}{\log_q x^2} = 0$. *Ungkapkan p dalam sebutan q.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

1

3

2 Given $\log_a b = m$ and $b\left(a^{2x}\right) = \sqrt[3]{b}$, express *x* in terms of *m*.

Diberi $\log_a b = m$ dan $b\left(a^{2x}\right) = \sqrt[3]{b}$ *ungkapkan x dalam dalam sebutan m.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

2

3

For Examiner's Use

3 The sum of the first *n* terms of an arithmetic progression is given by $S_n = n^2 - 3n$.

Hasil tambah n sebutan pertama bagi suatu janjang aritmetik diberi oleh $S_n = n^2 - 3n$

Find

Cari

(a) the value of *n* if the sum of the first 10 terms is 70

nilai n jika hasil tambah 10 sebutan pertama ialah 70.

(b) the sum of 6th term to the 10th term.

Hasil tambah sebutan ke-6 *hingga sebutan ke*-10.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

(b)

3

4

For Examiner's Use

4 The first eight terms of a geometric progression are $T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8 \ldots$ Given the sum to infinity of the odd terms is $\frac{27}{4}$ and the sum to infinity of the even terms is $\frac{9}{4}$. Find the first term and common ratio.

Lapan sebutan pertama janjang geometri ialah $T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8 \ldots$ *Diberi hasil tambah ketakterhinggan bagi sebutan ganjil ialah* $\frac{27}{4}$ *dan hasil tambah ketakterhinggaan bagi sebutan genap ialah* $\frac{9}{4}$. *Cari sebutan pertama dan nisbah sepunya.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

4

3

For Examiner's Use

5 Diagram 5 shows a graph of a quadratic function $f(x)=-(x+1)^2+5$ that has the maximum point of $(-1,k)$.

Rajah 5 *menunjukkan satu graf fungsi kuadratik* $f(x)=-(x+1)^2+5$ *yang mempunyai titik maksimum* $(-1,k)$.

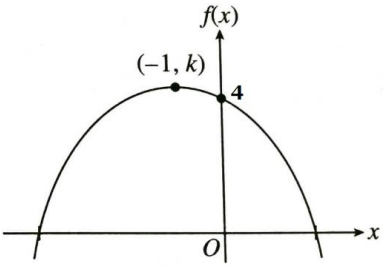


Diagram 1
Rajah 1

(a) Find the value of *k*.
cari nilai k

(b) Function $g(x)$ is produced when the function $f(x)$ is reflected on the y-axis. Find the function $g(x)$.
Fungsi $g(x)$ *terhasil apabila fungsi* $f(x)$ *dipantulkan pada paksi-y. tentukan fungsi* $g(x)$.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan*:

(a)

(b)

5
2

Examiner's Use

6 If the quadratic equation $(m+3)x^2+2m=12x$ has real roots, determine the range of values of m.

Jika persamaan kuadratik $(m+3)x^2+2m=12x$ mempunyai punca-punca nyata, tentukan julat nilai *m*.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

6

3

For Examiner's Use

7 Diagram 2.1 shows the non-linear graph represented by the equation $y = 3x^3 + px$.
The non-linear equation is reduced to form a linear graph in Diagram 2.2 with y-intercept = 2 and in Diagram 2.3 with y-intercept = $2p - q$

Rajah 2.1 *menunjukkan graf tak linear yang diwakili oleh persamaan* $y = 3x^3 + px$.
Persamaan tak linear tersebut diturunkan untuk membentuk graf linear pada Rajah 2.2 *dengan pintasan-y=2 dan pada Rajah* 2.3 *dengan pintasan-y =* $2p - q$

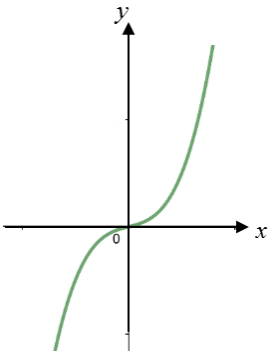


Diagram 2.1
Rajah 2.1

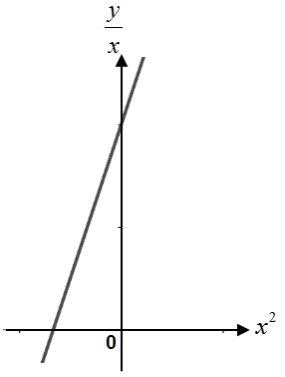


Diagram 2.2
Rajah 2.2

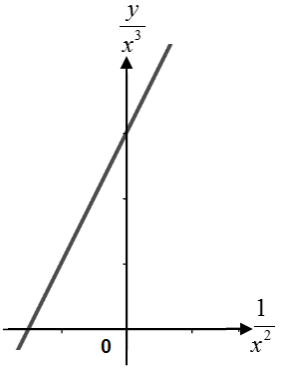


Diagram 2.3
Rajah 2.3

Find the value of *p* and of *q*
Cari nilai p dan nilai q.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

7

4

For Examiner's Use

8 Diagram 3 shows a graph of a function $g(x)$.

Rajah 3 *menunjukkan graf bagi fungsi* $g(x)$

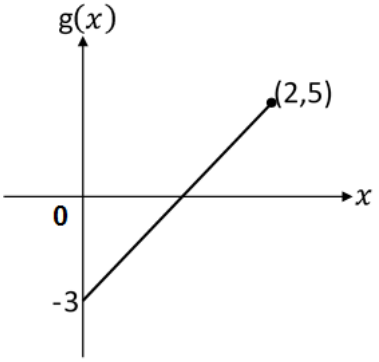


Diagram 3

Rajah 3

(a) If the range of $g(x)$ for the domain $0 \le x \le 2$ is $-3 \le g(x) \le \frac{m}{2}$. Determine the value of m

Jika julat bagi $g(x)$ *untuk domain* $0 \le x \le 2$ *ialah* $-3 \le g(x) \le \frac{m}{2}$. *Tentukan nilai m*

(b) Determine the function $g^{-1}(x)$.

Tentukan fungsi $g^{-1}(x)$.

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(a) .

(b)

8

3

9 Given $f(x)=\frac{m}{3x-n}, x\neq\frac{1}{3}$

Diberi $f(x)=\frac{m}{3x-n}, x\neq\frac{1}{3}$

(a) State the value of *n*

Nyatakan nilai n

(b) If $3f(-1)+f(1)=-1$. Find the value of *m*.

Jika $3f(-1)+f(1)=-1$. *Cari nilai m*.

[3 *marks*]

[3 *markah*]

Answer / *Jawapan*:

(a) .

(b)

For Examiner's Use

10

Diagram 4

Rajah 4

Diagram 4 shows an overview of the Theme Park containing various games. A Theme Park charges an entrance fee of RM45 and visitors have to pay an additional fee to play each game. The average money spent by 60 visitors shows an unreasonable value of RM25. The review found that the theme park counter staff made a mistake by deducting the additional fee with the entrance fee for the 60 visitors. Find the real average of the money spent by a visitor

Rajah 4 *menunjukkan satu gambaran Taman Tema yang mengandungi pelbagai permainan. Sebuah Taman Tema mengenakan bayaran masuk sebanyak* RM45 *dan pengunjung perlu membuat bayaran tambahan bagi bermain setiap permainan. Purata wang yang dibelanjakan oleh* 60 *pengunjung menunjukkan nilai yang tidak munasabah iaitu* RM25. *Semakan semula mendapati bahawa pekerja kaunter Taman Tema tersebut melakukan kesilapan dengan menolak bayaran tambahan dengan yuran masuk bagi* 60 *pengunjung tersebut. Cari purata sebenar wang yang dibelanjakan oleh seorang pengunjung*

[4 *marks*]

[4 *markah*]

Answer / *Jawapan*:

10

4

11 A bag contains 4 white marbles, 3 red marbles and 2 blue marbles that are all the same size.

Sebuah beg mengandungi 4 *biji guli putih,* 3 *biji guli merah dan* 2 *biji guli biru yang kesemuanya sama saiz.*

(a) If a marble is randomly removed from the bag, find the probability that the marble is not red.
jika sebiji guli dikeluarkan secara rawak dari beg itu, Cari kebarangkalian guli tersebut bukan merah.

(b) If the first marble removed is not re-inserted, then the second marble is removed. Calculate the probability that only 1 red marble is removed.
guli pertama yang dikeluarkan tidak dimasukkan semula, seterusnya guli kedua dkeluarkan. Cari kebarangkalian hanya 1 *guli merah dikeluarkan.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a) .

(b)

11

4

For Examiner's Use

12 (a) A squash team consisting of 4 men and 4 women is to be formed from 6 men and 7 women. Find the number of ways a selection can be made if 2 of the 7 women are inseparable

Satu pasukan squasy yang terdiri daripada 4 *lelaki dan* 4 *perempuan hendak dibentuk daripada* 6 *lelaki dan* 7 *perempuan. Cari bilangan cara pemilihan boleh dibuat jika* 2 *daripada* 7 *perempuan tersebut tidak boleh dipisahkan.*

(b) 7 letters to be selected from UNCOPYRIGHTABLE to form a keyword. Find the number of passwords that can be formed if it it must start and end with a vowel and the letter in the middle of the password must be a consonant.

7 *huruf hendak dipilih daripada* UNCOPYRIGHTABLE *untuk membentuk suatu kata kunci. Cari bilangan password yang dapat dibentuk sekiranya ianya mesti dimulai dan diakhiri dengan vokal dan huruf ditengah-tengah password mesti konsonan*.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

(b)

12

4

13 In a dart game exercise. The probability that Ramesh hits the target is *p*. Given the mean and standard deviation of success respectively is 18 and $3\left(\sqrt{\frac{10}{7}}\right)$. Find the value of *p*.

Dalam satu latihan permainan dart. Kebarangkalian Ramesh mengena tepat pada sasaran ialah p. Diberi min dan sisihan piawai kejayaan masing-masing ialah 18 *dan* $3\left(\sqrt{\frac{10}{7}}\right)$. *Cari nilai p.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

13

3

For Examiner's Use

14 Given that vector $\overrightarrow{PQ} = (k+2)x + 4y$. If $\overrightarrow{PQ}$ is extended to point R where $\overrightarrow{QR} = hx + y$. Express *k* in terms of *h*.

Diberi bahawa vektor $\overrightarrow{PQ} = (k+2)x + 4y$. *Jika* $\overrightarrow{PQ}$ *dipanjangkan kepada titik R dengan keadaan* $\overrightarrow{QR} = hx + y$. *Ungkapkan k dalam sebutan h.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

14

3

15 Diagram 5 shows a sketch of a river with a width of 50 meters and the velocity of the current flowing downstream is $2.5\ ms^{-1}$.

Rajah 5 *menunjukkan lakaran sebatang sungai dengan kelebarannya* 50 *meter dan halaju arus yang mengalir ke hilir ialah* $2.5\ ms^{-1}$

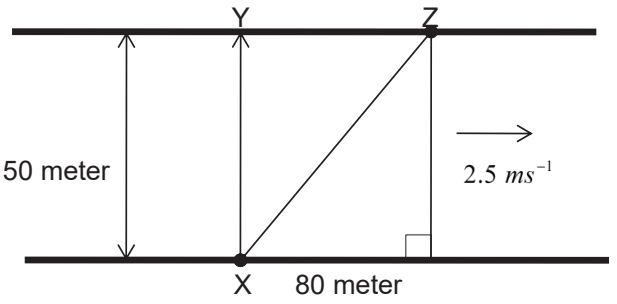


Diagram 5

Rajah 5

Ahmad wanted to paddle his boat from X to the other side of the river at Y but his boat was carried away by the current and stopped at Z in 12 seconds. Calculate the speed of Ahmad paddling his boat.

Ahmad ingin mendayung perahunya dari X ke seberang sungai di Y tetapi perahunya telah dibawa arus dan berhenti di Z dalam masa 12 *saat. Hitung laju Ahmad mendayung perahunya.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

15

4

For Examiner's Use

16 Diagram 6 shows a straight line PQ extended to R. The equation of the PQ is $\frac{x}{h}-\frac{y}{k}=1$.

Rajah 6 *menunjukkan garis lurus PQ yang disambungkan ke R. Persamaan garis PQ adalah* $\frac{x}{h}-\frac{y}{k}=1$.

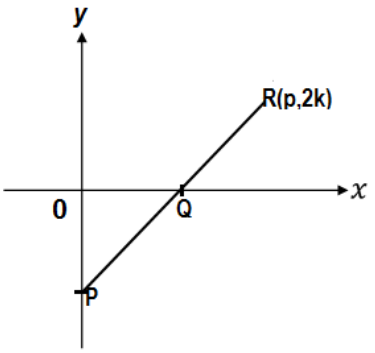


Diagram 6

Rajah 6

(a) Find the gradient of *PQ* in term of *h* and *k*.
Cari kecerunan PQ dalam sebutan h dan k.

(b) Express *h* in term of *p*
Ungkapkan h dalam sebutan p

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(a)

(b)

16

3

For Examiner's Use

17 Diagram 7 shows the curve $y^2 = x + 4$ intersects the *x*-axis at *A* and the *y*-axis at *B* and *C*.

Rajah 7 *menunjukkan lengkung bersilang pada paksi-x di A dan paksi-y di B dan C.*

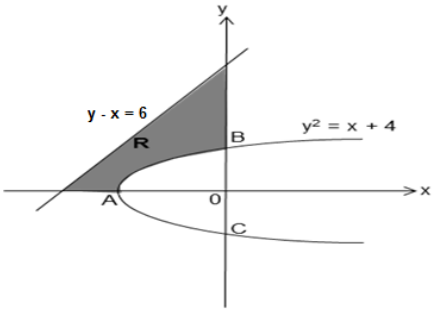


Diagram 7

Rajah 7

Find the volume of the shaded region *R* revolved through 360° about the *y*-axis.

Cari isipadu janaan kawasan berlorek R dikisarkan melalui 360° *pada paksi-y*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

17

3

For Examiner's Use

18 (a) Convert 0.1312 rad angle to degrees and minutes.

Tukarkan sudut 0.1312 rad kepada darjah dan minit.

(b) Diagram 8 shows a semicircle centre at *O* with a diameter of *2h*. Given $\angle XOY = \alpha\ rad$ and arc $XY = \frac{1}{4}h$.

Rajah 8 *menunjukkan sebuah semi bulatan berpusat O dengan diameter adalah 2h . Diberi* $\angle XOY = \alpha\ rad$ *dan lengkok* $XY = \frac{1}{4}h$.

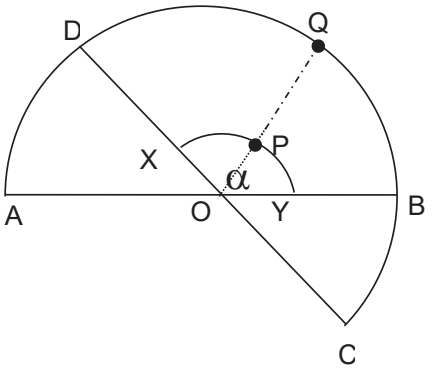


Diagram 8

Rajah 8

Find the length of *PQ* in term of α and *h.*

Cari panjang PQ dalam sebutan α *dan h.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(a)

(b)

18

3

19 Diagram 9 shows graph $y = \sin 2x$ and $y = kos\ 2x$ intersect at two points.

Rajah 9 *menunjukkan graf* $y = \sin 2x$ *dan graf* $y = kos\ 2x$ *bersilang pada dua titik.*

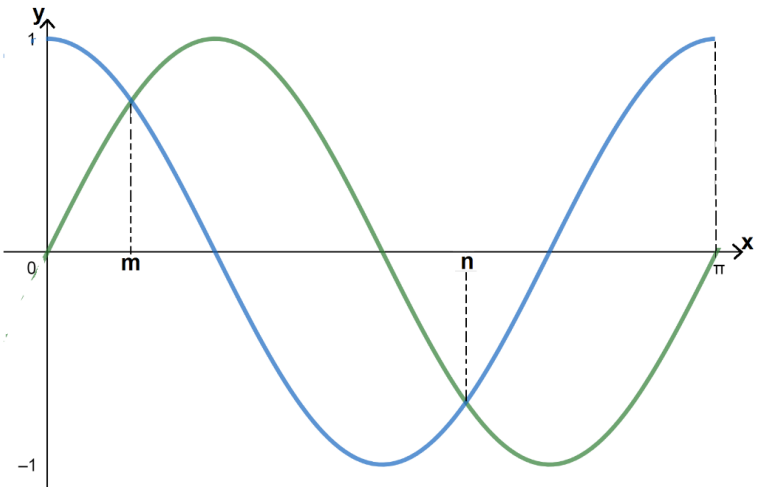


Diagram 9

Rajah 9

Find the value of *m* and of *n*.

Cari nilai *m* dan nilai *n*.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

19

3

For Examiner's Use

20 Diagram 10 shows point $P(h,1)$ located at the circumference of a circle.

Rajah 10 *menunjukkan titik* $P(h,1)$ *terletak pada lilitan bulatan*

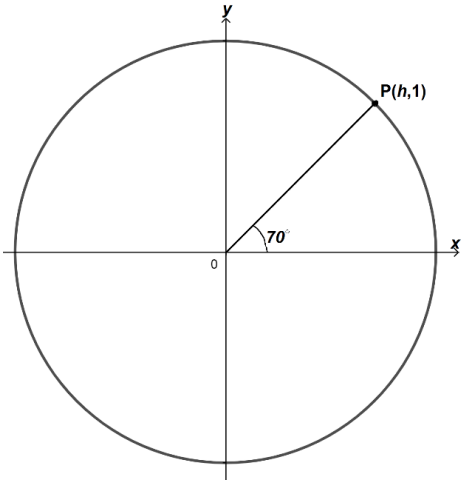


Diagram 10

Rajah 10

Find, in term of *h*,

Cari dalam sebutan h,

(a) $\cos 70°$

(b) $\tan 140°$

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(a)

(b)

20

3

21 Given $h = 3x - 2$ and $k = x^2 - 1$. Complete the information in the blank box provided.

Diberi $h = 3x - 2$ *dan* $k = x^2 - 1$. *Lengkapkan maklumat dalam kotak kosong yang disediakan.*

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(a) $\frac{dh}{dx} =$ ☐ $\frac{dk}{dx} =$ ☐

(b) $\frac{dk}{dh} =$ ☐

21

3

For Examiner's Use

22 Diagram 11 shows a box with a square base which has a total surface area of 216 cm^2

Rajah 11 *menunjukkan sebuah kotak dengan tapak segi empat sama yang mempunyai jumlah luas permukaan* 216 cm^2.

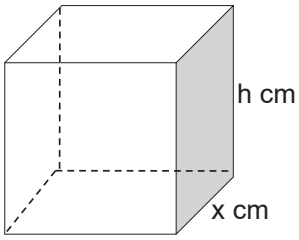


Diagram 11
Rajah 11

Find the value of x that makes V maximum.
Cari nilai x yang menjadikan V maksimum.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

22

3

23 Mr. Ramli is a small entrepreneur, he wants to invest RM 2000 in a spice business. He is confident that his investment, RM y will increase at a rate $2(x+121)$ which x is time in year.

Encik Ramli merupakan seorang usahawan kecil-kecilan , beliau ingin melabur wang sebanyak RM 2000 *dalam suatu perniagaan rempah ratus. Beliau berkeyakinan bahawa pelaburannya, RM y akan meningkat pada kadar* $2(x+121)$ *dengan* x *ialah masa dalam tahun.*

Find the number of years it takes for his investment money to be doubled from his original investment.

Cari bilangan tahun yang diperlukan untuk wang pelaburan beliau itu menjadi dua kali ganda daripada pelaburan asalnya.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

23

4

For Examiner's Use

24 Given $\int_0^p q\,dx = \int_0^q (-p+1)dx$.

Diberi bahawa $\int_0^p q\,dx = \int_0^q (-p+1)dx$.

Find the value of p

Cari nilai p.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan*:

23

4

For Examiner's Use

25 Figure 12 shows two firecrackers that were launched simultaneously and exploded at their maximum height. Firecracker 1 is represented by a function $f(t) = -3t^2 + 24t$ and Firecracker 2 is represented by a function $h(t) = -5t^2 + 20t$, where *f* and *h* represents the height in the firecracker explosion in meter and *t* time in seconds after launch.

Rajah 12 *menunjukkan dua batang mercun telah dilancarkan serentak dan meletup pada ketinggian maksimum masing-masing. Tembakan Mercun* 1 *diwakili oleh fungsi* $f(t) = -3t^2 + 24t$ *dan tembakan mercun* 2 *diwakili oleh fungsi* $h(t) = -5t^2 + 20t$, *dimana f dan h mewakili tinggi dalam meter letupan bunga api itu dan t masa dalam saat selepas dilancarkan.*

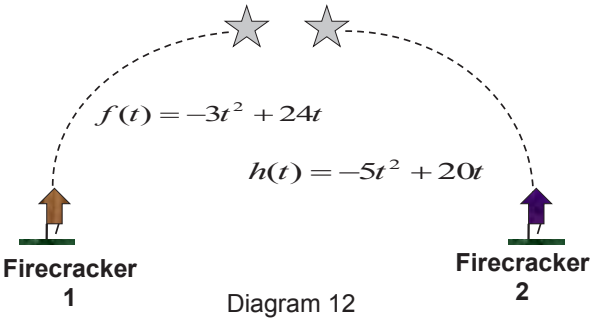


Diagram 12
Rajah 12

Did the two firecrackers explode at the same height? Give your reason.
Adakah kedua-dua mercun itu meletup pada ketinggian yang sama? Beri sebab anda.

[4 *marks*]
[4 markah]

25

4

Answer / *Jawapan:*

END OF QUESTION PAPER
KERTAS PEPERIKSAAN TAMAT