SULIT
3472/1
Matematik Tambahan
Kertas 2
Oktober

PEPERIKSAAN PERCUBAAN TAHUN 2020
TINGKATAN 5

3472/2

ADDITIONAL MATHEMATICS
Kertas 2

2½ jam

Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa.*
2. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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

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 $(a^m)^n = a^{nm}$

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

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

$= \int_a^b y \, dx$ or

$= \int_a^b x \, dy$

5 Volume generated

$= \int_a^b \pi y^2 \, dx$ or

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

GEOMETRY

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

2 Midpoint

$(x, y) = \left(\dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2} \right)$

3 $|r| = \sqrt{x^2 + y^2}$

4 $\hat{r} = \dfrac{xi + yj}{\sqrt{x^2 + y^2}}$

5 A point dividing a segment of a line

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

6. Area of triangle =

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

STATISTIC

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 $I = \dfrac{P_1}{P_0} \times 100$

7 $\bar{I} = \dfrac{\sum w_1 I_1}{\sum w_1}$

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, $\mu = np$

13 $\sigma = \sqrt{npq}$

14 $z = \dfrac{x-\mu}{\sigma}$

TRIGONOMETRY

1 Arc length, $s = r\theta$

2 Area of sector, $A = \dfrac{1}{2}r^2\theta$

3 $\sin^2 A + \cos^2 A = 1$

4 $\sec^2 A = 1 + \tan^2 A$

5 $\operatorname{cosec}^2 A = 1 + \cot^2 A$

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 $\tan 2A = \dfrac{2\tan A}{1 - \tan^2 A}$

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

10 $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$

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

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

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

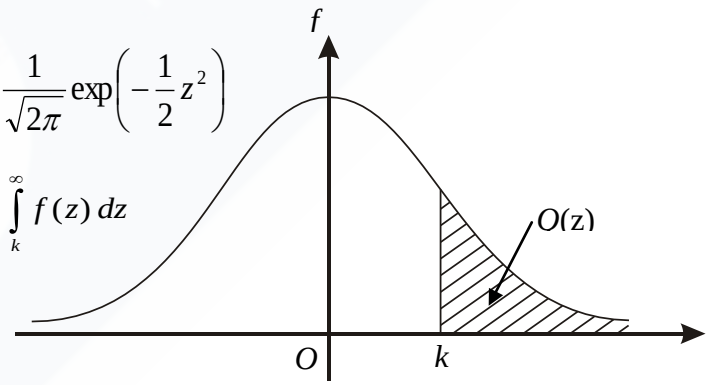
14 Area of triangle $= \dfrac{1}{2}ab\sin C$

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	0..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

Jika $X \sim N(0, 1)$, *maka*

$P(X>k) = Q(k)$

Section A
***Bahagian* A**
[40 marks]
[40 *markah*]

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

1. Diagram 1 shows a trapezium $ABCD$.

Rajah 1 *menunjukkan trapezium ABCD.*

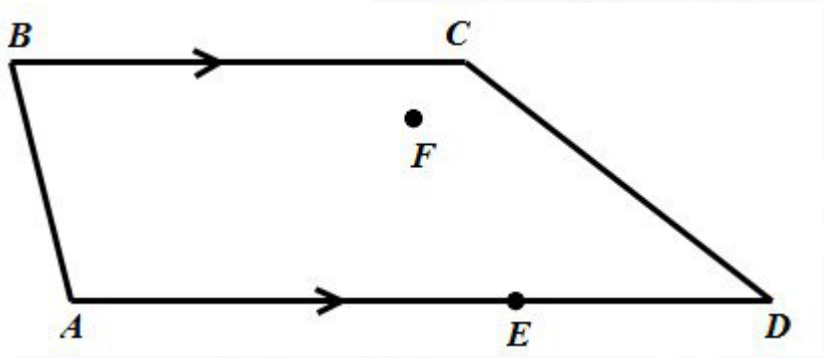


Diagram 1/*Rajah* 1

It is given that $\overrightarrow{AB} = 4\underset{\sim}{y}$, $\overrightarrow{AD} = 14\underset{\sim}{x}$, $\overrightarrow{AE} = \frac{4}{7}\overrightarrow{AD}$ and $\overrightarrow{BC} = \frac{5}{7}\overrightarrow{AD}$.

Diberi bahawa $\overrightarrow{AB} = 4\underset{\sim}{y}$, $= 14\underset{\sim}{x}$, $\overrightarrow{AE} = \frac{4}{7}\overrightarrow{AD}$ *dan* $\overrightarrow{BC} = \frac{5}{7}\overrightarrow{AD}$.

(a) Express $\overrightarrow{AC}$ in terms of $\underset{\sim}{x}$ and $\underset{\sim}{y}$.

Ungkapkan $\overrightarrow{AC}$ *dalam sebutan* $\underset{\sim}{x}$ *dan* $\underset{\sim}{y}$.

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

(b) Point F lies inside the trapezium $ABCD$ such that $4\overrightarrow{EF} = k\overrightarrow{AB}$ and k is a constant.

Titik F terletak di dalam trapezium ABCD dengan keadaan $4\overrightarrow{EF} = k\overrightarrow{AB}$ *dan k ialah pemalar.*

(i) Express $\overrightarrow{AF}$ in terms of k, $\underset{\sim}{x}$ and $\underset{\sim}{y}$.

Ungkapkan $\overrightarrow{AF}$ *dalam sebutan k,* $\underset{\sim}{x}$ *dan* $\underset{\sim}{y}$.

(ii) Hence, if the points A, F and C are collinear, find the value of k.

Seterusnya, jika titik-titik A, F dan C adalah segaris, cari nilai k.

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

2. Table 1 shows the distribution of number of questions answered by 40 students in a competition.

Jadual 1 *menunjukkan taburan bilangan soalan yang dijawab oleh* 40 *orang pelajar dalam satu pertandingan.*

Number of questions *Bilangan soalan*	Frequency *Kekerapan*
1 – 5	2
6 – 10	9
11 – 15	10
16 – 20	8
21 – 25	8
26 – 30	3

Table 1/ *Jadual* 1

Find / *Cari*

(a) the interquartile range, [4 *marks*]
julat antara kuartil, [4 *markah*]

(b) the number of students that answered at lest 21 questions. [1 *mark*]
bilangan pelajar yang telah menjawab sekurang-kurangnya 21 *soalan.* [1 *markah*]

3. The curve $y = ax + \frac{b}{x^2}$ has a gradient function of $2 + \frac{16}{x^3}$, where a and b are constants.

Lengkung $y = ax + \frac{b}{x^2}$ *mempunyai fungsi kecerunan* $2 + \frac{16}{x^3}$, *dengan keadaan a dan b ialah pemalar.*

(a) Find the values of a and b. [3 *marks*]
Cari nilai a dan nilai b. [3 *markah*]

(b) Find the turning point of the curve. Hence, determine whether the turning point is a minimum or a maximum point.
Cari titik pusingan lengkung itu. Seterusnya, tentukan sama ada titik pusingan itu ialah titik minimum atau titik maksimum. [4 *marks*]
[4 *markah*]

[Lihat halaman sebelah

4. A cylindrical wedding cake which consists of different sizes with a fixed height of 7 cm and placed one on top of the other. Given that the circumference of the top most cake is 18π .The radius of each subsequent cake is increased by 3 cm from the top of it. The volume of the bottom most cake is 3087π cm^3. Find

Sebiji kek perkahwinan berbentuk silinder yang bertingkat-tingkat mempunyai saiz yang berbeza-beza dengan ketinggian tetap 7 cm. *Diberi bahawa lilitan kek yang paling atas berukuran* 18π . *Jejari setiap kek yang berikutnya bertambah sebanyak* 3 cm *daripada kek di atasnya. Isipadu kek yang paling bawah ialah* 3087π cm^3 . *Cari*

(a) the height, in cm, of the wedding cake, [4 *marks*]
ketinggian, dalam cm, *kek perkahwinan tersebut,* [4 *markah*]

(b) the total circumference, in cm, of the wedding cake. [4 *marks*]
jumlah lilitan bulatan, dalam cm, *kek perkahwinan tersebut.* [4 *markah*]

5. Diagram 2 shows a plan of 5 terraced houses to be built on Encik Dzulkifli's land.
Rajah 2 *menunjukkan pelan bagi* 5 *buah rumah teres yang akan dibina di atas tanah Encik Dzulkifli.*

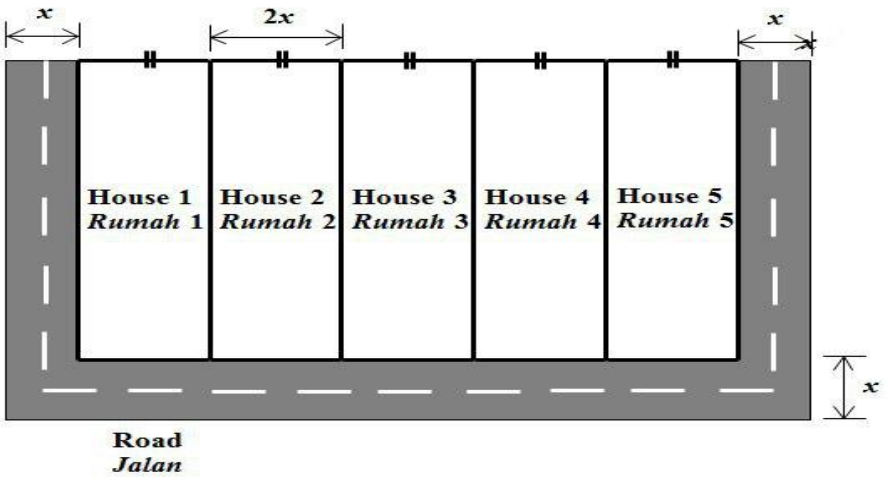


Diagram 2/*Rajah* 2

The perimeter of the whole 5 houses is 160 m. He allocated an area of 600 m^2 to construct a road in front of the houses and on both sides of the end lot as in Diagram 2. The width of the road is *x* m. Find the length and width, in m, of each house. [7 *marks*]

Perimeter kesemua 5 *buah rumah ialah* 160 *meter. Dia memperuntukkan luas sebanyak* 600 m^2 *untuk membina jalan di hadapan dan kedua-dua sisi rumah lot hujung seperti Rajah* 2. *Lebar jalan ialah x* m. *Cari Panjang dan lebar, dalam meter, setiap rumah.*

[7 *markah*]

6.

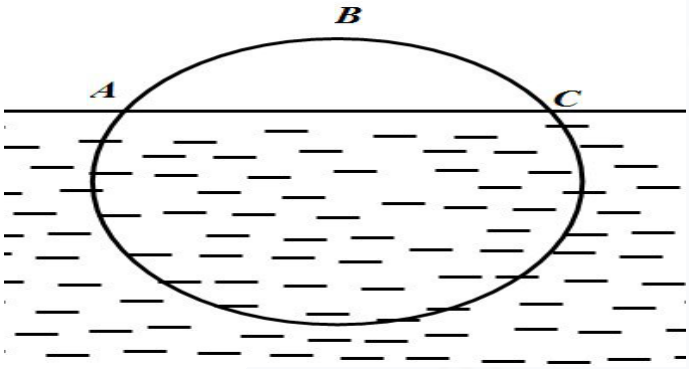


Diagram 3/*Rajah* 3

Diagram 3 shows the circled cross-section of a timber which is floating in the water with radius 80 cm. Line *AC* is the water surface and *B* is the highest point from the water surface. The ratio of the highest point *B* from the water surface to the diameter of the circle is $1:4$. Calculate

Rajah 3 *menunjukkan keratan rentas bulatan bagi sebatang kayu balak berjejari* 80 cm *terapung di dalam air. Garis AC adalah permukaan air dan B adalah titik tertinggi dari permukaan air. Nisbah titik tertinggi B dari permukaan air kepada diameter bulatan adalah* $1:4$. *Hitungkan*

[Use/ Guna $\pi = 3.142$]

(a) the length of arc *ABC*. [3 *marks*]

panjang lengkuk ABC. [3 *markah*]

(b) the area of cross-section below the water surface. [4 *marks*]

luas keratan rentas yang berada di bawah permukaan air. [4 *markah*]

Section *B*
Bahagian B
[40 marks]
[40 *markah*]
Answer **four** questions from this section.
Jawab **empat** *soalan daripada bahagian ini.*

7. Use the graph paper provided to answer this question.
Gunakan kertas graf yang disediakan untuk menjawab soalan ini.

Table 2 shows the values of two variables , x and y, obtained from an experiment.

Variables x and y are related by the equation $y = \frac{p}{(x+1)^k}$, where k and p are constants.

Jadual menunjukkan nilai-nilai bagi dua pemboleh ubah , x dan *y dihubungkan oleh persamaan* $y = \frac{p}{(x+1)^k}$ *, dengan keadaan k dan p ialah pemalar .*

x	0.5	1	2	3	4	5
y	9.277	4.571	1.555	0.750	0.418	0.251

Table 2/*Jadual* 2

(a) Plot $\log_{10} y$ against $\log_{10}(x+1)$, using a scale of 2 cm to 0.1 unit on the $\log_{10}(x+1)$- axis and 2 cm to 0.2 units on the $\log_{10} y$- axis. Hence, draw the line of best fit. [5 *marks*]

Plot $\log_{10} y$ *melawan* $\log_{10}(x+1)$ *, menggunakan skala* 2 cm *kepada* 0.1 *unit pada paksi-*$\log_{10}(x+1)$ *dan* 2 cm *kepada* 0.2 *unit pada paksi-*$\log_{10} y$.
Seterusnya, lukis garis lurus penyuaian terbaik. [5 *markah*]

(b) Using the graph in 7(a) , find the value of,
Menggunakan graf di 7(a) *, cari nilai*

(i) k

(ii) p

(iii) y when $x = 1.3$
y *apabila* $x = 1.3$

[5 *marks*]
[5 *markah*]

8. Diagram 4 shows a straight line *QR* intersects the straight line *PQ* at point *Q*.

Rajah 4 menunjukkan garis lurus QR bersilang dengan garis lurus PQ pada titik Q.

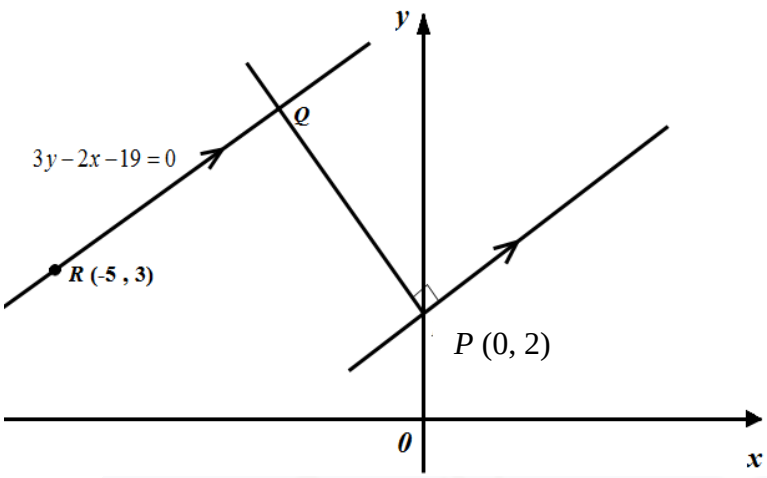


Diagram 4/*Rajah* 4

Given that the equation of the straight line *QR* is $3y-2x-19=0$

Diberi persamaan garis lurus QR ialah $3y-2x-19=0$

(a) Find

Cari

(i) The equations of the straight line *PQ*.

Persamaan garis lurus PQ.

(ii) Coordinates of *Q*.

Koordinat bagi Q

[4 *marks*]

[4 *markah*]

(b) The straight line *PQ* is extended to a point $S\left(-5,\frac{19}{2}\right)$ such that $PQ:PS=m:n$

Garis lurus PQ dipanjangkan ke suatu titik $S\left(-5,\frac{19}{2}\right)$ *dengan keadaan*

$PQ:PS = m:n$

Find

Cari

(i) the ratio of $m:n$

Cari nisbah m : n

(ii) the area of triangle *PRS*

Luas segi tiga PRS

[4 *marks*]

[4 *markah*]

[Lihat halaman sebelah

(c) A point T moves such that its distance from point Q is always 5 units. Find the equations of the locus of point T

Satu titik T bergerak dengan keadaan jaraknya dari titik Q sentiasa 5 *unit. Cari persamaan lokus bagi titik T*

[2 *marks*]

[2 *markah*]

9. (a) Prove that $\tan 3x = \dfrac{3\tan x - \tan^3 x}{1-3\tan^2 x}$. [3 *marks*]

Buktikan $\tan 3x = \dfrac{3\tan x - \tan^3 x}{1-3\tan^2 x}$. [3 *markah*]

(b) Sketch the graph of $y = 1 - \tan 3x$ for $0 \le x \le \pi$.

Lakarkan graf bagi $y = 1 - \tan 3x$ untuk $0 \le x \le \pi$.

Hence, using the same axes , sketch a suitable straight line to find the number of solutions for the equations $\dfrac{2x}{\pi} + \dfrac{3\tan x - \tan^3 x}{1-3\tan^2 x} = 0$ for $0 \le x \le \pi$. State the number of solutions. [7 *marks*]

Seterusnya, dengan menggunakan paksi yang sama, lakar satu garis lurus yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $\dfrac{2x}{\pi} + \dfrac{3\tan x - \tan^3 x}{1-3\tan^2 x} = 0$ *untuk* $0 \le x \le \pi$ *. Nyatakan bilangan penyelesaian itu.*

[7 *markah*]

10. (a) In a school, 352 students sat for an examinations. The marks obtained is normally distributed with a mean is μ and a standard deviation is 5.

Dalam sebuah sekolah, 352 *orang pelajar menduduki suatu peperiksaan. Markah yang diperoleh adalah bertaburan secara normal dengan min ialah* μ *dan sisihan piawai ialah* 5.

Find

Cari

(i) The value of μ if the probability of a student chosen at random get marks less than 58 is 0.3085.

Nilai μ *jika kebarangkalian seorang pelajar yang dipilih secara rawak mendapat markah kurang daripada* 58 *ialah* 0.3085.

(ii) The number of students who achieved marks more than 65.

Bilangan pelajar yang mencapai markah lebih daripada 65.

[6 *marks*]

[6 *markah*]

(b) The probability of a consumer shops online is m. A sample of 6 consumers are chosen at random from a particular area.

Kebarangkalian bahawa seorang pengguna membeli-belah atas talian ialah m. *Suatu sampel* 6 *orang pengguna dipilih secara rawak daripada suatu kawasan.*

Calculate

Hitung

(i) The value of m if the probability that none of the consumers shop online is $\frac{1}{729}$.

Nilai m *jika kebarangkalian tiada pengguna tersebut membeli-belah atas talian ialah* $\frac{1}{729}$.

(ii) The probability that less than 2 consumers shop online.

Kebarangkalian bahawa terdapat kurang daripada 2 *pengguna membeli belah atas talian.*

[4 *marks/markah*]

[Lihat halaman sebelah

11. Diagram 5 below shows the graph of $y = x^2 + 4$. The straight line $y = 4x$ is the tangent to the curve at the point where $x = k$ and the straight line $y = -4x$ is the tangent to the curve at the point where $x = -k$.

Rajah 5 menunjukkan graf $y = x^2 + 4$. Garis lurus $y = 4x$ adalah tangen kepada lengkung di titik di mana $x = k$ dan garis lurus $y = -4x$ adalah tangen kepada lengkung di titik di mana $x = -k$.

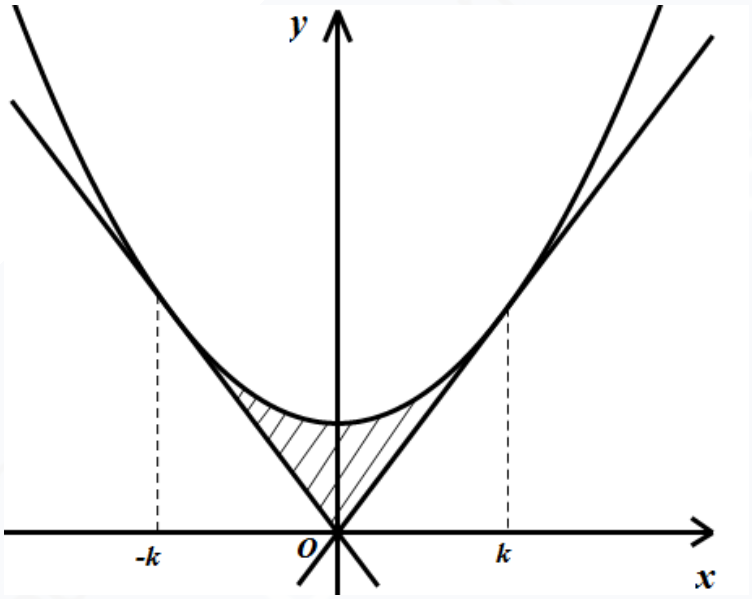


Diagram 5/*Rajah* 5

Find

Cari

(a) the value of *k*, [2 *marks*]

nilai k, [2 *markah*]

(b) the area of the shaded region, [5 *marks*]

luas rantau berlorek, [5 *markah*]

(c) the volume generated when the area bounded by the curve and the line $y = 5$ is revolved 180° around the *y*-axis. [3 *marks*]

isipadu yang dijanakan apabila rantau yang dibatasi oleh lengkung dan garis lurus $y = 5$ diputarkan 180° di sekitar paksi –y. [3 *markah*]

Section C

***Bahagian* C**

[20 marks/ *markah*]

Answer **two** questions in this section .

Jawab ***dua*** *soalan dalam bahagian ini.*

12. A particle *X* moves along a straight line and passes through a fixed point *O* with a velocity of v ms^{-1} given by $v = 2t^2 - 5t - 3$, where t is the time in seconds after leaving the point *O* .

Suatu zarah X bergerak pada satu garis lurus dan melalui titik tetap O dengan halaju v ms$^{-1,}$ *diberi oleh* $v = 2t^2 - 5t - 3$, *di mana t ialah masa dalam saat selepas meninggalkan titik O.*

[Assume motion to the right is positive]

[*Anggap gerakan ke arah kanan sebagai positif*]

Find

Cari

(a) initial velocity,
halaju awal,

[1 *marks*]

[1 *markah*]

(b) The displacement, in m, when the particle stops instantaneously,
sasaran , dalam m*, apabila zarah itu berhenti seketika,*

[5 *marks*]

[5 *markah*]

(c) the range of time, in seconds, when the particle decelerates,
Julat masa, dalam saat, apabila zarah itu mengalami nyahpecutan,

[2 *markah*]

[2 *markah*]

(d) the total distance travelled, in metre, by the particle in the first 5 seconds.
jumlah jarak,dalam meter, yang dilalui oleh zarah itu dalam 5 *saat pertama.*

[2 *marks*]

[2 *markah*]

[Lihat halaman sebelah

13. Solution by scale drawing is not accepted.

Penyelesaian secara lukisan berskala tidak diterima.

Diagram 6 shows a tetrahedron *ABCD* such that $\angle BAC = 64^\circ$, $\angle ACD = 35°$, $\angle BDC = 104°$, $AB = 8$ cm and $BD = 15$ cm.

Rajah 6 *menunjukkan sebuah tetrahedron ABCD dengan keadaan* $\angle BAC = 64^\circ$, $\angle ACD = 35°$, $\angle BDC = 104°$, $AB = 8$ cm *dan* $BD = 15$ cm.

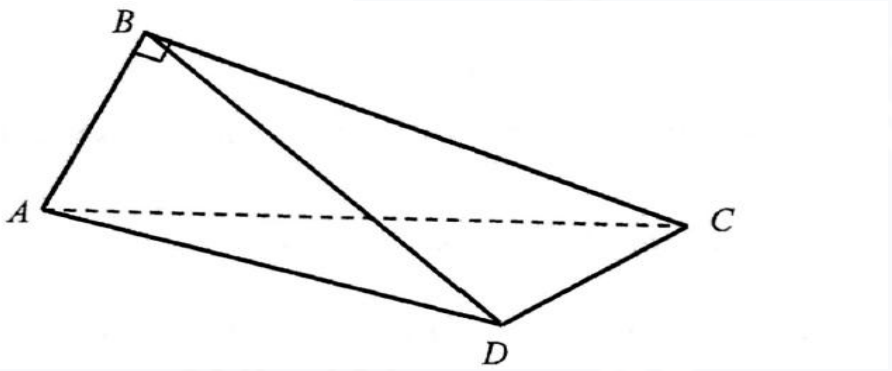


Diagram 6/*Rajah* 6

It is given that the area of triangle *BCD* is 29 cm^2 and *ABC* is a right angle triangle.

Diberi bahawa luas segi tiga BCD ialah 29 cm^2 *dan ABC adalah segi tiga bersudut tegak.*

(a) Calculate

Hitung

(i) The length, in cm of *CD*.

Panjang, dalam cm *bagi CD*

(ii) The length , in cm of *AD*.

Panjang dalam cm *bagi AD.*

(iii) $\angle CAD$.

[7 *marks*]

[7 *markah*]

(b) Point *C*' lies on *AC* such that *DC*' = *DC* .

Titik C' terletak pada AC dengan keadaan DC' = DC

(i) Sketch the triangle $\Delta ADC'$.

Lakar segi tiga triangle $\Delta ADC'$.

(ii) Find the length, in cm, for *AC*'.

Cari panjang, dalam cm, *bagi AC*' [3 *marks*]

[3 *markah*]

14. A tailor makes two types of cloths, which are trousers and shirt. In a week, he makes x trousers and y shirts. The cost of making a trousers is RM 80 and a shirt is RM 40. The production of cloth is based on the following constraints:

Seorang tukang jahit membuat dua jenis pakaian, iaitu seluar panjang dan kemeja. Dalam seminggu, dia membuat x helai seluar panjang dan y helai kemeja . Kos untuk menghasilkan sehelai seluar panjang ialah RM 80 *dan sehelai kemeja ialah* RM 40. *Penghasilan pakaian adalah berdasarkan kekangan berikut*:

I: The maximum total number of trousers and shirts must be 80.

Jumlah maksimum seluar panjang dan kemeja ialah 80.

II: The number of shirts must exceed the number of trousers by at least 5.

Bilangan kemeja mesti melebihi bilangan seluar panjang sekurang-kurangnya 5.

III: The minimum cost of produce the cloths is RM 3200.

Kos minimum bagi menghasilkan pakaian tersebut ialah RM 3200.

(a) Write three inequalities other than $x \geq 0$ and $y \geq 0$ which satisfy all the above constraints.

Tulis tiga ketaksamaan selain daripada $x \geq 0$ *dan* $y \geq 0$ *yang memenuhi semua kekangan di atas.*

[3 *marks*]

[3 *markah*]

(b) Using a scale of 2 cm to 10 clothes on both axes, construct and shade the region R which satisfies all the above constraints.

Menggunakan skala 2 cm *kepada* 10 *helai pakaian pada kedua-dua paksi, bina dan lorek rantau R yang memenuhi semua kekangan di atas.*

[3 *marks*]

[3 *markah*]

(c) Using the graph constructed in14(b), find

Menggunakan graf yang dibina di 14(b)*, cari*

(i) the minimum number of shirts produced,

bilangan minimum kemeja yang dihasilkan

(ii) the maximum cost for the production of the clothes

kos maksimum bagi menghasilkan pakaian tersebut

[4 *marks*]

[4 *markah*]

[Lihat halaman sebelah

15. Table 3 shows the prices of three items that are sold in a shop in the years 2015 and 2017. Diagram 7 show the pie chart shows the sales comparison for all the three items.

Jadual 3 *di bawah menunjukkan harga bagi tiga barang yang dijual di sebuah kedai pada tahun* 2015 *dan tahun* 2017. *Rajah* 7 *menunjukkan carta pai di bawah menunjukkan perbandingan jualan bagi ketiga-tiga barang tersebut.*

Item *Barang*	Price in the year 2015 *Harga pada tahun* 2015	Price in the year 2017 *Harga pada tahun* 2017
Umbrella *Payung*	RM 40.00	RM 54.00
Shoes *Kasut*	RM 75.00	RM 90.00
Bag *Beg*	RM 30.00	*X*

Table 3/ Rajah 3

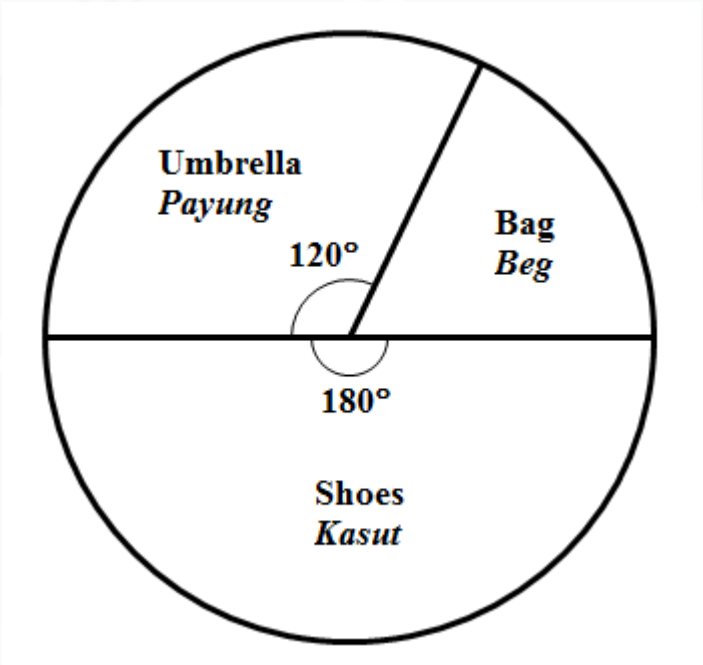


Diagram 7/ *Rajah* 7

The prices of all the items are increased by 10% from the year 2017 to the year 2018 and with average percent of increasing by 36.95% for the year 2018 compared to the year 2015.

Harga semua barang tersebut meningkat sebanyak 10% *dari tahun* 2017 *ke tahun* 2018 *dan peratus peningkatan secara purata sebanyak* 36.95% *pada tahun* 2018 *berbanding tahun* 2015.

(a) Calculate the price of the shoes in the year 2018 .

Hitung harga kasut pada tahun 2018.

[2 *marks*]

[2 *markah*]

(b) Find the index composite in the year 2017 compare to the year 2015.

Cari indeks gubahan bagi tahun 2017 *berbanding dengan tahun* 2015.

[3 *marks*]

[3 *markah*]

(c) Calculate the price of the bag in the year 2017.

Hitung harga beg pada tahun 2017.

[5 marks]

[5 *markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

[Lihat halaman sebelah