

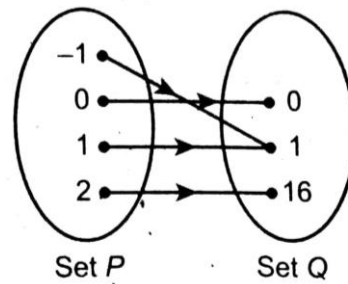
SOALAN PEPERIKSAAN PERCUBAAN SPM 2021

KERTAS 1 / PAPER 1

SET 2

1.

Kuasa empat bagi
To the power of four



Rajah 1/ Diagram 1

(a) Rajah 1 menunjukkan hubungan antara set P dan set Q . Nyatakan

Diagram 1 shows the relation between set P and set Q . State

i) Julat hubungan itu ,

The range of the relation,

ii) jenis hubungan itu.

the type of relation.

[2 markah/ 2 marks]

(b) Diberi bahawa fungsi $f: x \rightarrow 9x - 2$

Given that the function $f: x \rightarrow 9x - 2$, find

i) Imej bagi 4,

The image of 4,

ii) objek bagi 16,

the object of 16,

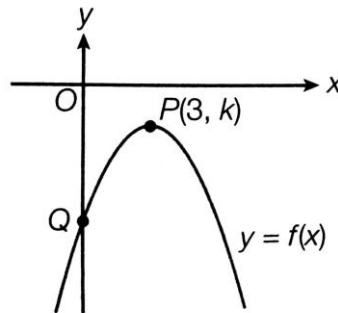
iii) f^2

[4 markah/ 4 marks]

Jawapan / Answer:

2. Rajah 2 menunjukkan graf bagi fungsi kuadratik $f(x) = -x^2 + mx - 11$.

Diagram 2 shows a graph of a quadratic function $f(x) = -x^2 + mx - 11$.



Rajah 2/ Diagram 2

Graf ini mempunyai titik maksimum $P(3, k)$ dan menyalang paksi-y pada titik Q .

The graph has a maximum point $P(3, k)$ and intersects the y-axis at point Q .

- (a) Nyatakan koordinat titik Q .

State the coordinate of the point Q .

- (b) Dengan menggunakan kaedah penyempurnaan kuasa dua, cari nilai k dan nilai m .

By using the method of completing the square, find the value of k and the value of m .

- (c) Tentukan julat nilai x jika $f(x) \geq -18$.

Determine the range of values of x if $f(x) \geq -18$.

[5 markah / 5 marks]

Jawapan / Answer:

3. (a) Permudahkan / Simplify .

$$\frac{3}{\sqrt{7} - 4}$$

[2 markah / 2 marks]

- (b) Selesaikan persamaan $\log_2 x^2 + \log_2 x = \frac{3}{4}$. Berikan jawapan anda betul kepada empat tempat perpuluhan.

Solve the equation $\log_2 x^2 + \log_2 x = \frac{3}{4}$. Give your answer correct to four decimal places.

[3 markah / 3 marks]

(c) Diberi $2^{n-1} \times 8^n = 2048$, cari nilai n .

Given $2^{n-1} \times 8^n = 2048$, find the value of n .

[2 markah / 2 marks]

Jawapan / Answer:

4. Jujukan nombor berikut menunjukkan bilangan orang yang menerima suntikan vaksin Covid 19 di sebuah pusat pemberian vaksin setiap hari dalam tempoh tertentu. Cari jumlah penerima vaksin dalam tempoh tersebut.

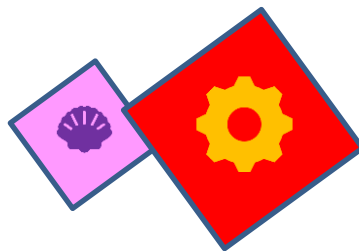
The following sequence of numbers shows the number of people who received an injection of Covid-19 vaccine in a vaccination centre every day for a specified period. Find the number of vaccine recipients during that period.

1024, 1536, 2304, ..., 26244.

[5 markah / marks]

Jawapan / Answer:

5. Rajah 5 menunjukkan dua keping jubin hiasan berbentuk segi empat sama. *Diagram 5 shows two pieces of the square shaped decorative tiles.*



Rajah 5 / Diagram 5

Diberi bahawa jumlah perimeter kedua-dua jubin itu ialah 32 cm manakala hasil tambah luas kedua-dua jubin ialah 34 cm^2 . Cari panjang sisi setiap jubin.

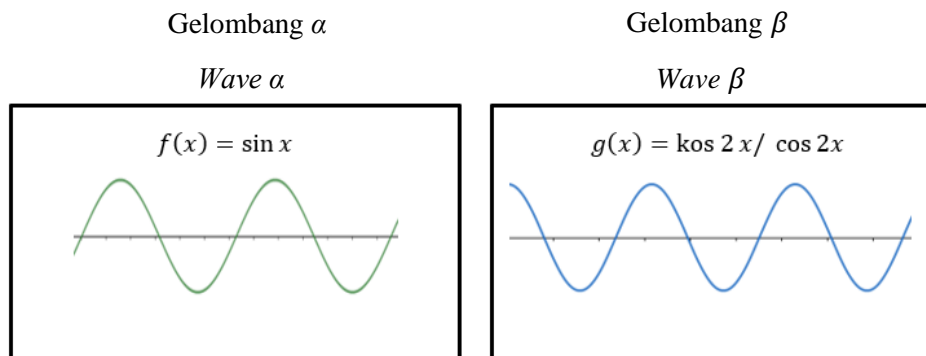
Given that the sum of the perimeters of both tiles is 32 cm while the sum of the areas of both tiles is 34 cm^2 . Find the length of sides of each tile.

[5 markah / marks]

Jawapan / Answer:

6. (a) Rajah 6 menunjukkan graf bagi dua gelombang iaitu Gelombang α dan Gelombang β untuk sudut-sudut x yang berterusan.

Diagram 6 shows the graphs of two waves, Wave α and Wave β for a continuous angle x .



Rajah 6 / Diagram 6

Cari nilai-nilai x untuk $0^\circ \leq x \leq 360^\circ$ apabila kedua-dua gelombang bertemu.

Find the values of x for $0^\circ \leq x \leq 360^\circ$ when both waves meet.

[3 markah / marks]

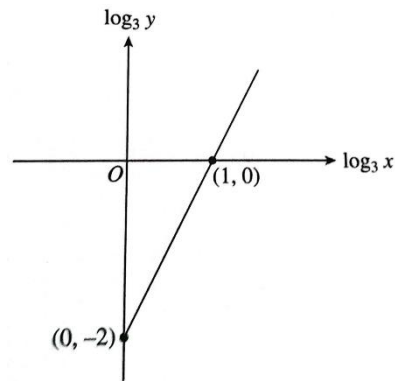
- (b) Diberi bahawa $\tan(A - B) = \frac{12}{5}$ dan $\tan A = \frac{2}{3}$, cari $\tan B$.

Given that $\tan(A - B) = \frac{12}{5}$ and $\tan A = \frac{2}{3}$, find $\tan B$.

[2 markah / marks]

Jawapan / Answer:

7.



Rajah 7 / Diagram 7

Rajah 7 menunjukkan graf garis lurus $\log_3 y$ melawan $\log_3 x$. Pemboleh ubah x dan y dihubungkan oleh persamaan $y = \frac{x^{2n}}{k}$, dengan keadaan n dan k ialah pemalar. Cari nilai n dan nilai k .

The diagram 7 shows a straight line graph of $\log_3 y$ against $\log_3 x$. The variable x and y are related by the equation $y = \frac{x^{2n}}{k}$, where n and k are constants. Find the values of n and k .

[6 markah/marks]

Jawapan / Answer:

8. Diberi bahawa $\underline{m} = \begin{pmatrix} -12 \\ 9 \end{pmatrix}$ dan $\underline{n} = \begin{pmatrix} 10 \\ p + 2 \end{pmatrix}$

It is given that $\underline{m} = \begin{pmatrix} -12 \\ 9 \end{pmatrix}$ and $\underline{n} = \begin{pmatrix} 10 \\ p + 2 \end{pmatrix}$

(a) Cari $|m|$.

Find $|m|$.

(b) Cari nilai p dengan keadaan $m + n$ adalah selari dengan paksi x .

Find the value of p such that $m + n$ is parallel to the x -axis.

(c) \underline{x} dan \underline{y} ialah vektor-vektor bukan sifar dan tidak selari. Diberi bahawa

$(p + q - 3)\underline{x} = (4 + q)\underline{y}$, dengan keadaan p dan q ialah pemalar. Cari nilai p dan nilai q .

\underline{x} and \underline{y} are the non-zero vectors and not parallel. It is given that $(p + q - 3)x = (4 + q)y$, such that p and q are constants. Find the value of p and q .

[6 markah/ marks]

Jawapan / Answer:

9. (a) Diberi had $\lim_{x \rightarrow a} \frac{\sqrt{x}-3}{x-9} = \frac{1}{6}$, cari nilai-nilai a .

Given $\lim_{x \rightarrow a} \frac{\sqrt{x}-3}{x-9} = \frac{1}{6}$, Find the value of a .

- (b) Cari nilai $\frac{dy}{dx}$ bagi $y = \frac{2}{x} - \frac{1}{x^2}$ apabila $x = 4$

Find the value $\frac{dy}{dx}$ for $y = \frac{2}{x} - \frac{1}{x^2}$ when $x = 4$

[6 markah/ marks]

Jawapan / Answer:

10. Diberi $\int_3^6 g(x) dx = \frac{7}{2}$, cari

Given $\int_3^6 g(x) dx = \frac{7}{2}$, find

- (a) Nilai bagi $\int_6^3 \frac{1}{4} g(x) dx$,

The value of $\int_6^3 \frac{1}{4} g(x) dx$,

- (b) Nilai q dengan keadaan $\int_3^6 2q dx = 16$.

The value of q such that $\int_3^6 2q dx = 16$.

[4 markah/ marks]

Jawapan / Answer:

11. Terdapat enam bekas ais krim berperisa berlainan yang terdiri daripada avocado, coklat, strawberi, manga, lemon dan vanila. Seorang penjual ingin menyusun ais krim itu dalam sebuah penyejuk beku.

There six boxes of different flavours of ice cream which are avocado, chocolate, strawberry, mango, lemon and vanilla. A seller wants to arrange the ice creams in a freezer.

- (a) Cari bilangan susunan berlainan dalam satu baris, jika dia hanya ingin menyusun tiga perisa ais krim itu.

Find the number of different arrangements in one row, if he wants to arrange only three flavours of the ice creams.

[2 markah/ marks]

- (b) Jika ais krim berperisa strawberi, coklat dan lemon dipaparkan, cari bilangan campuran perisa ais krim berlainan yang boleh dipilih oleh seorang pembeli.

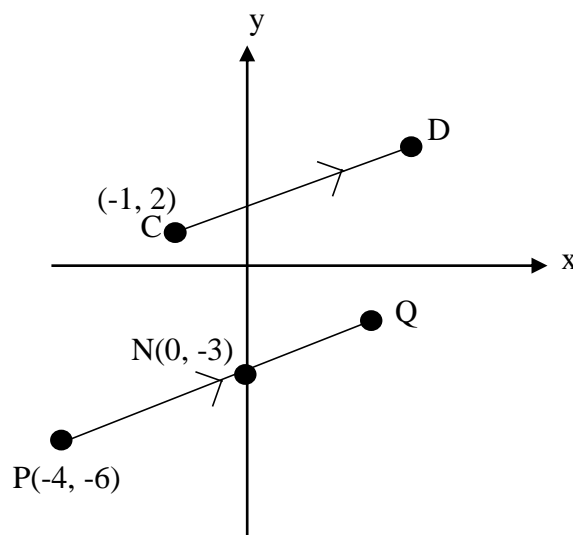
If the strawberry, chocolate and lemon flavored ice creams are displayed, find the number of different mixed flavours of ice creams can be chosen by a buyer.

[2 markah/ marks]

Jawapan / Answer:

12. Dalam Rajah 12, titik $N(0, -3)$ membahagi tembereng garis PQ mengikut nisbah 2:1. Koordinat titik P ialah $(-4, -6)$. Koordinat titik C ialah $(-1, 2)$.

In Diagram 12, the point $N(0, -3)$ divides the line segment PQ in the ratio 2:1. The coordinates of point P are $(-4, -6)$. The coordinates of point C is $(-1, 2)$.



Rajah 12/Diagram 12

- (a) Cari koordinat bagi titik Q .

Find the coordinates of point Q .

[2 markah/ marks]

- (b) Cari persamaan garis lurus CD .

Find the equation of the straight line CD .

[2 markah/ marks]

- (c) Titik $K(x,y)$ bergerak dengan keadaan jarak titik K dari titik Q sentiasa sama dengan jarak NQ .

Point $K(x,y)$ moves such that the distance of point K from point Q always the same with the distance of NQ .

- (i) Huraikan lokus bagi titik bergerak K .
Describe the locus of the moving point K .
- (ii) Seterusnya, cari persamaan lokus bagi titik bergerak K .

Hence, find the equation of locus of moving point K .

[3 markah/ marks]

Jawapan / Answer:

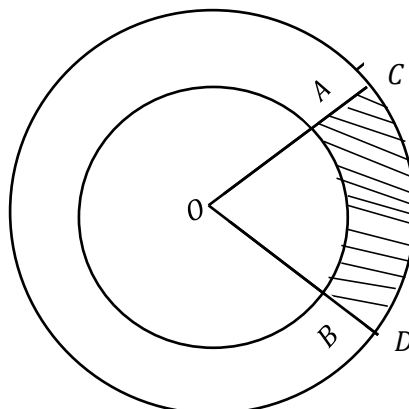
- 13 (a) Seutas dawai dibengkokkan untuk membentuk sebuah sektor bulatan dengan pusat O dan berjari 6 cm. Jika luas sector ialah 18 cm^2 , cari panjang, dalam cm, dawai itu.

A piece of wire is bent to form a sector of a circle with centre O and of radius 6 cm. If the area of the sector is 18 cm^2 , find the length, in cm, of the wire.

[4 markah/4 marks]

- (b) Rajah 13 menunjukkan AB dan CD ialah dua lengkok bagi dua bulatan yang mempunyai pusat yang sama, O .

Diagram 13 shows AB and CD are two arcs of two circles that have the same centre, O .



Rajah 13/Diagram 13

Diberi panjang lengkok AB dan CD masing-masing ialah 13.1 cm dan 23.6 cm. Jika jejari bulatan kecil ialah 6 cm, cari perimeter, dalam cm, rantau berlorek $ABCD$.

Given that the length of the arcs AB and CD are 13.1 cm and 23.6 cm respectively. If the radius of the small circle is 6 cm, find the perimeter, in cm, of the shaded region $ABCD$.

[4 markah/4 marks]

Jawapan/Answer:

- 14 (a) Dalam suatu kajian di sebuah daerah tertentu, didapati tiga daripada lima keluarga memiliki sebuah kereta nasional. Jika 10 keluarga dari daerah itu dipilih secara rawak, hitung kebarangkalian bahawa sekurang-kurangnya 8 keluarga memiliki sebuah kereta nasional.
- In a survey carried out in a particular district, it is found that three out of five families own a national car. If 10 families are chosen at random from the district, calculate the probability that at least 8 family own a national car.*

[4 markah/4 marks]

- (b) Jisim murid di sebuah sekolah mempunyai taburan normal dengan min 54 kg dan sisihan piawai 12 kg. Carikan

The masses of students in a school have a normal distribution with a mean of 54 and a standard deviation of 12 kg. Find

- (i) jisim murid apabila skor piawai ialah 0.5,
the mass of the students which gives a standard score of 0.5,
- (ii) peratus murid yang jisimnya lebih daripada 48 kg.
the percentage of students with a mass of greater than 48 kg.

[4 markah/4 marks]

Jawapan/Answer:

- 15 (a) Suatu lengkung $y = f(x)$ adalah dengan keadaan $\frac{dy}{dx} = 3kx + 5$, k ialah pemalar. Kecerunan lengkung itu di $x = 2$ ialah 9. Cari nilai k .

The curve $y = f(x)$ is such that $\frac{dy}{dx} = 3kx + 5$, where k is a constant. The gradient of the curve at $x = 2$ is 9. Find the value of k .

[2 markah/2 marks]

- (b) Kecerunan tangen kepada lengkung $y = x^2(2 + px)$ di $x = -2$ ialah 7. Cari nilai p .

The gradient of the tangent to the curve $y = x^2(2 + px)$ at $x = -2$ is 7. Find the value of p .

[3 markah/3 marks]

- (c) Cari $\int_4^a (x + 4) dx$, dalam sebutan a .

Find $\int_4^a (x + 4) dx$, in terms of a .

[3 markah/3 marks]

Jawapan/Answer:

KERTAS SOALAN TAMAT

SOALAN PEPERIKSAAN PERCUBAAN SPM 2021

PERATURAN PEMARKAHAN KERTAS 1

SET 2

SOALAN	PERATURAN PEMARKAHAN	MARKAH	JUMLAH MARKAH
1. (a)	i-Julat = { 0, 1, 16 } ii- Hubungan banyak kepada satu	N1 N1	2
(b)	i- $f(4) = 9(4)-2$ $= 36-2$ $= 34$ ii- $f(x) = 16$ $9x-2 = 16$ $x = 2$ iii- $f^2 = 9(9x - 2)-2$ $= 81x - 20$	N1 N1 K1 N1	4 6 M
2 (a)	Q (0,-11)	N1	1
(b)	$f(x) = -x^2 + mx - 11$ $= - [x^2 - mx] - 11$ $= - \left[\left(x - \frac{m}{2}\right)^2 - \left(-\frac{m}{2}\right)^2 \right] - 11$ $= - \left(x - \frac{m}{2}\right)^2 + \frac{m^2}{4} - 11$ $3 = \frac{m}{2} \quad k = \frac{6^2}{4} - 11$ $m = 6 \quad \quad \quad = -2$	P1 N1 N1N1	4 5 M

3. (a)	$\frac{3}{\sqrt{7}-4} \times \frac{\sqrt{7}+4}{\sqrt{7}+4}$ $\frac{3(\sqrt{7}+4)}{(\sqrt{7}-4)\sqrt{7}+4}$ $\frac{3\sqrt{7}+12}{-9}$ $\frac{\sqrt{7}+4}{-3}$	K1 N1	2
(b)	$\log_2 x^2 + \log_2 x = \frac{3}{4}$ $\log_2 x^3 = \frac{3}{4}$ $x = 2^{\frac{1}{4}}$ $x = 1.1892$	P1 K1 N1	3
(c)	$2^{n-1} \times 8^n = 2048$ $2^{n-1} \times 2^{3n} = 2^{11}$ $2^{n-1+3n} = 2^{11}$ $n-1+3n = 11$ $n=3$	K1 N1	2 7 M
4.	$\frac{1536}{1924} = \frac{2304}{1536} = 1.5 \quad \text{ATAU} \quad a=1024 \text{ dan } r$ $= 1.5$ $T_n = 26244, \quad 1024(1.5)^{n-1} = 26244$ $(1.5)^{n-1} = 25.629$ $n-1 = \frac{\log_{10} 25629}{\log_{10} 1.5}$ $n-1=8, \quad n=9$ $S_9 = \frac{1024(1.5^n - 1)}{1.5 - 1}$ $= 76684$	P1 K1 K1 N1 N1	5 5 M
5.	<p>Katakan panjang sisi : x dan y Perimeter : $4x + 4y = 32$ atau $x + y = 8$</p> <p><i>Luas</i> : $x^2 + y^2 = 34$ $x^2 + (8-x)^2 = 34$ $2x^2 - 16x + 30 = 0$</p>	P1 K1 K1	5

	$(x - 3)(x - 5) = 0, x = 3, 5$ Jawapan : Panjang sisi jubin ialah 3 cm dan 5 cm.	K1 N1	5 M
6. (a)	$\sin x = \cos 2x$ $\sin x - \cos 2x = 0$ $\sin x - (1 - 2\sin^2 x) = 0$ $2 \sin^2 x + \sin x - 1 = 0$ $\sin x = \frac{1}{2}, x = 30^\circ, 150^\circ$ $\sin x = -1, x = 270^\circ$	K1 K1 N1	3
(b)	$\frac{\tan A - \tan B}{1 + \tan A \tan B} = \frac{12}{5}$ $5(\tan A - \tan B) = 12(1 + \tan A \tan B)$ $5\left(\frac{2}{3}\right) - 5 \tan B = 12 + 12\left(\frac{2}{3}\right) \tan B$ $\tan B = -\frac{2}{3}$	K1 N1	2 5 M
7.	$\log_3 y = \log_3 x^{2n} - \log_3 k$ $\log_3 y = 2n \log_3 x - \log_3 k$ $m=2n, c = -\log_3 k$ $\frac{0 - (-2)}{1 - 0} = 2n, -2 = -\log_3 k$ $n = 1 \quad k = 9$	K1 P1 (either) K1K1 N1 N1	6 6 M
8. (a)	(a) $\sqrt{-12^2 + 9^2} = 15$ unit	K1 N1	2
(b)	b) $\begin{pmatrix} -2 \\ 11 + p \end{pmatrix}$ $p = -11$	K1 N1	2
(c)	(c) $4 + q = 0$ $q = 0$ $p + q - 3 = 0$ $p = 7$	N1 N1	2 6 M
9. (a)	<i>had</i> $x \rightarrow a \frac{\sqrt{x-3} \circ \sqrt{x+3}}{x-9 \sqrt{x+3}}$ $\frac{1}{\sqrt{a+3}} = \frac{1}{6}$	K1 K1	3

	$a = \pm 16$	N1	
(b)	$\frac{dy}{dx} = \frac{-2x+2}{x^3}$ $= \frac{-2(4)+2}{(4)^3}$ $= -\frac{3}{32}$	P1 K1 N1	3 6 M
10. (a)	$\frac{1}{4}(-\frac{7}{2})$ $-\frac{7}{8}$	K1 N1	2
(b)	$2q[x]_3^6 = 16$ $k = \frac{8}{3}$	K1 N1	2 4 M
11.(a)	$6P_3$ 120	K1 N1	2
(b)	$3C_2 + 3C_3$ 4	K1 N1	2 4 M
12.(a)	$0 = \frac{2x-4}{3} \text{ OR } -3 = \frac{2y-6}{3}$ $(2, -\frac{3}{2})$	K1 N1	2
(b)	$y - 2 = \frac{3}{4}(x + 1)$ $4y = 3x + 11$	K1 N1	2
(c)	<p>(i) Suatu bulatan berpusat di Q dengan jejari $\frac{5}{2}$ unit.</p> <p>(ii) $\sqrt{(x-2)^2 + (y+\frac{3}{2})^2} = \frac{5}{2}$</p> $x^2 + y^2 - 4x + 3y = 0$	P1 K1 N1	3 7 M
13. (a)	$\theta = 1 \text{ rad}$	K1	

	<p>S/panjang lengkung = 6 cm</p> <p>Panjang dawai = 6 + 6 + 6</p> <p>18 cm</p>	<p>K1</p> <p>K1</p> <p>N1</p>	<p>4</p>
(b)	<p>$\angle AOB = 2.183 \text{ rad}$</p> <p>Jejari bulatan besar = 10.81 cm</p> <p>Perimeter = 13.1 + 23.6 + 4.81 + 4.81</p> <p>46.32 cm</p>	<p>K1</p> <p>K1</p> <p>K1</p> <p>N1</p>	<p>4</p> <hr/> <p>8 M</p>
14. (a)	$10C8 \left(\frac{3}{5}\right)^8 \left(\frac{2}{5}\right)^2 + 10C9 \left(\frac{3}{5}\right)^9 \left(\frac{2}{5}\right)^1 + 10C10 \left(\frac{3}{5}\right)^{10} \left(\frac{2}{5}\right)^0$ <p>0.1673</p>	<p>K1K1K1</p> <p>N1</p>	<p>4</p>
(b) i-	$0.5 = \frac{X - 54}{12}$ <p>60 kg</p>	<p>K1</p> <p>N1</p>	<p>4</p> <hr/> <p>8 M</p>
ii-	$\left(Z > \frac{48 - 54}{12}\right)$ <p>0.6915</p> <p>69.15%</p>	<p>K1</p> <p>N1</p>	<p>4</p> <hr/> <p>8 M</p>
15. (a)	<p>$9 = 3k(2) + 5$</p> <p>$k = \frac{2}{3}$</p>	<p>K1</p> <p>N1</p>	<p>2</p>
(b)	$\frac{dy}{dx} = 4x + 3px^2$ <p>$7 = 4(-2) + 3p(-2)^2$</p>	<p>K1</p> <p>K1</p>	<p>3</p>

	$p = \frac{5}{4}$	N1	
(c)	$\left[\frac{x^2}{2} + x\right]_4^a$	K1	3
	$\left[\frac{a^2}{2} + a\right] - \left[\frac{4^2}{2} + 4\right]$	K1	
	$\frac{a^2}{2} + a - 12$	N1	8 M

Section A

[50 markah]

[50 marks]

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

1 Suatu fungsi g ditakrifkan sebagai $g: x \rightarrow \frac{x^2-1}{2}$ untuk $0 \leq x \leq 3$

The function f is defined as $g: x \rightarrow \frac{x^2-1}{2}$ for $0 \leq x \leq 3$

(a) Pada satah yang sama, lakarkan graf bagi fungsi g dan g^{-1} .

On the same plane, sketch the graph of function g and g^{-1} .

[2 markah]

[2 marks]

(b) Dengan menggunakan ujian garis mengufuk, terangkan kenapa g^{-1} wujud.

Using horizontal line test, explain why g^{-1} exist.

[2 markah]

[2 marks]

(c) Cari

Find.

(i) g^{-1}

(ii) domain dan julat bagi g^{-1}

(iii) domain and range of g^{-1}

[3 markah]

[3 marks]

Jawapan / Answer:

- 2 Ungkapkan $x^2 - 3x + 5$ dalam bentuk $a(x - b)^2 + c$, di mana a, b dan c adalah pemalar. *Kemudian, nyatakan*

Express $x^2 - 3x + 5$ in the form of $a(x - b)^2 + c$, where a, b and c are constants.

Hence, state

- a) nilai minimum bagi $x^2 - 3x + 5$
the minimum value of $x^2 - 3x + 5$
- b) nilai x apabila nilai minimum wujud
the value of x at which the minimum value occurs.
- c) Lakarkan graf bagi $x^2 - 3x + 5$
Sketch the curve of $x^2 - 3x + 5$

[8 markah]

[8 marks]

Jawapan / Answer:

- 3 Seorang penternak ayam mempunyai 3000 ekor ayam. Bermula pada keesokan harinya, beliau menjual 25 ekor ayam setiap hari. Hitung

A chicken farmer has 3000 chickens. Starting the next day, he sell 25 chickens a day.

Calculate

- (a) Pada hari keberapakah terdapat 2000 ekor ayam yang dijual.
On what day are 2000 chickens sold.
- (b) Jumlah pendapatan penternak itu hingga hari yang terdapat 2000 ekor ayam yang belum dijual jika beliau membelanjakan 15 sen untuk makanan bagi setiap ekor ayam setiap hari.

The total income of the breeder up to the day there are 2000 unsold chickens if he spends 15 sen on food for each chicken per day.

[7 markah]

[7 marks]

Jawapan / Answer:

- 4 Sebuah syarikat automobil mempunyai kilang pemasangan di bandar A , B dan C untuk memasang tiga model kereta, P , Q dan R . Jadual 1 di bawah menunjukkan bilangan kereta bagi setiap model yang dapat dipasang setiap hari di setiap kilang itu.

An automobile company has an assembly factory in town A , B and C to assemble three types of car, P , Q and R . The table 1 below shows the number of cars for each model assembled in each assembly factory every day.

Model	Bandar A Town A	Bandar B Town B	Bandar C Town C
P	10	20	40
Q	20	15	45
R	5	35	30

Jadual 1 / Table 1

Syarikat itu telah menerima tempahan sebanyak 640 buah kereta model P , 750 buah kereta model Q dan 650 buah kereta model R . Berapa harikah diperlukan di setiap kilang untuk memenuhi tempahan itu? Anggapkan semua kilang itu beroperasi setiap hari.

The company has received 640 orders for car model P , 750 orders for car model Q and 650 orders for car model R . How many days will each assembly factory needs to fulfill the orders? Assume all assembly factories operate every day.

[6 markah]

[6 marks]

Jawapan / Answer:

5 (a) Selesaikan persamaan berikut:

Solve the following equation:

$$8^{\log_2 u} = 125$$

[3 markah]

[3 marks]

(b) Sebuah segi tiga bersudut tegak mempunyai panjang tapak $(2\sqrt{3} + 1)$ m dan tinggi h m. Jika luas segitiga itu ialah $\frac{1}{2}(9\sqrt{3} - 1)\text{m}^2$, cari nilai h . Beri

jawapan anda dalam bentuk $a + b\sqrt{3}$, dengan keadaan a dan b ialah pemalar.

A right angled triangle has the based of $(2\sqrt{3} + 1)$ m and height h m. If the area of the triangle is $\frac{1}{2}(9\sqrt{3} - 1)\text{m}^2$, find the value of h . Give your answer in the form of $a + b\sqrt{3}$, where a and b are contants.

[4 markah]

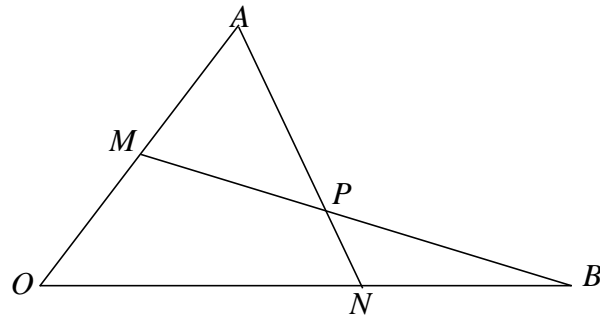
[4 marks]

Jawapan / Answer:

6 Maklumat berikut merujuk kepada rajah 1 di bawah :

The following information refer to the diagram 1 below:

$\vec{OA} = 4\vec{a}$ $\vec{OB} = 8\vec{b}$ $\vec{AP} = \alpha \vec{AN}$ $OA = 2MA$ $ON : OB = 5 : 8$



Rajah 1 / Diagram 1

(a) Ungkapkan / Express

- (i) vektor \vec{MB} dalam sebutan \vec{a} dan \vec{b} ,
vector \vec{MB} in terms of \vec{a} and \vec{b} ,
- (ii) vektor \vec{AP} dalam sebutan α , \vec{a} dan \vec{b} ,
vector \vec{AP} in terms of α , \vec{a} and \vec{b} ,
- (iii) vektor \vec{MP} dalam sebutan α , \vec{a} dan \vec{b} ,
vector \vec{MP} in terms of α , \vec{a} and \vec{b} ,

[5 markah]

[5 marks]

(b) Diberi M, P dan B adalah segaris, cari nilai α .

Given M, P and B are collinear, find the value of α .

[3 markah]

[3 marks]

Jawapan / *Answer*:

7. a) Cari persamaan garis lurus yang melalui titik $(-1, 5)$ dan berserenjang dengan garis lurus yang menyambungkan titik $(2, -6)$ dan titik $(3, 8)$.

[4 markah]

Find the equation of the straight line that passes through the point $(-1, 5)$ and is perpendicular to the straight line that joins point $(2, -6)$ and point $(3, 8)$.

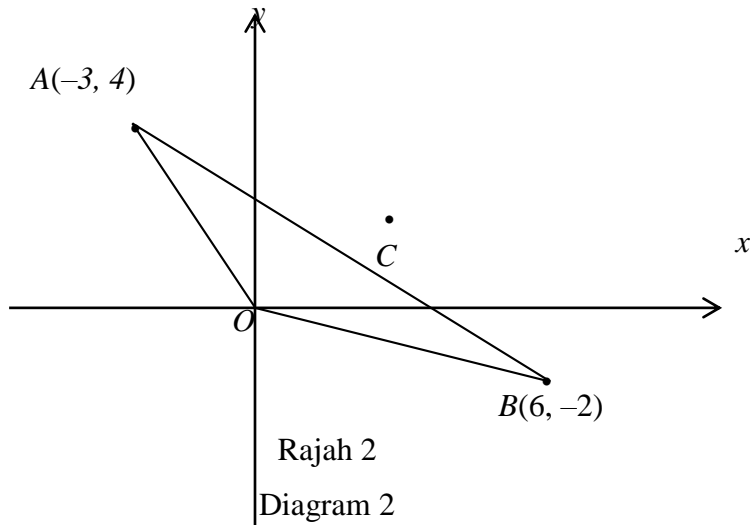
[4 marks]

- b) Penyelesaian melalui lukisan skala tidak akan diterima.

Solution to this question by scale drawing will not be accepted.

Rajah 2 menunjukkan segitiga AOB di mana O adalah asalan. Titik C terletak di atas garis lurus AB.

Diagram 2 shows the triangle AOB where O is the origin. Point C lies on the straight line AB.



Kira luas, dalam unit^2 , segitiga AOB.

[2 markah]

Calculate the area, in unit^2 , of triangle AOB.

[2 marks]

- c) Diberi $AC : CB = 3 : 2$, cari koordinat C.

[2 markah]

Given that $AC : CB = 3 : 2$, find the coordinates of C.

[2 marks]

Jawapan / *Answer*:

Bahagian B
Section B

[30 markah]

[30 marks]

Jawab mana-mana **tiga** soalan daripada bahagian ini.

Answer any **three** questions from this section.

8. a) Rajah 3 menunjukkan garis lurus $y = x + 4$ yang menyilang lengkung $y = (x - 2)^2$ pada titik A dan B. Cari,

Diagram 3 shows the straight line $y = x + 4$ intersecting the curve $y = (x - 2)^2$ at the points A and B. Find,

- (i) Nilai k , [3 markah]
the value of k , [3 marks]

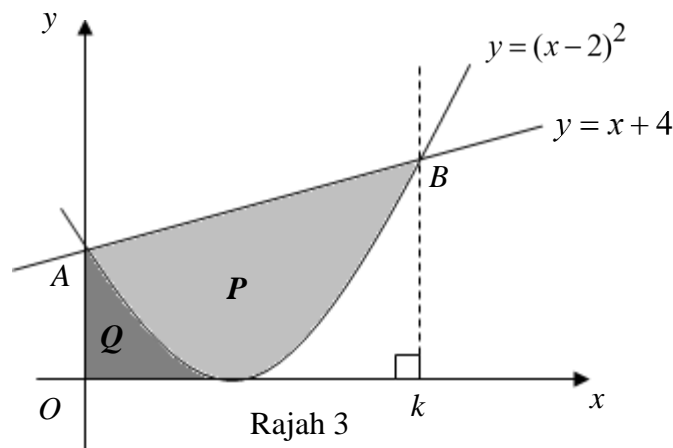
- (ii) luas rantau berlengkung P. [4 markah]
the area of the shaded region P. [4 marks]

- (iii) isipadu janaan, dalam sebutan π , bila rantau berlengkung Q dikisarkan 360° pada paksi-x.

the volume generated, in terms of π , when the shaded region Q is revolved 360° about the x-axis.

[3 markah]

[3 marks]



Rajah 3
Diagram 3

SULIT

12

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[4 markah]

[4 marks]

Jawapan / Answer:

9. a) Buktikan identiti $\sin (90^\circ + A) = \cos A$
Prove the identities $\sin (90^\circ + A) = \cos A$

[2 markah]

[2 marks]

- b) Lakarkan graf $y = 3 \cos 2x + 2$ bagi $0 < x < \pi$. Seterusnya, tentukan bilangan penyelesaian bagi persamaan trigonometri $3x \cos 2x = \pi - 2x$.
Sketch the graph $y = 3 \cos 2x + 2$ for $0 < x < \pi$. Then, determine the number of solutions for trigonometric equations $3x \cos 2x = \pi - 2x$.

[4 markah]

[4 marks]

- c) Cari nilai x yang tercangkum di antara 0° dengan 360° yang memuaskan persamaan
 $\sin 2x + \cos x = 0$

[3 markah]

*Find the values of x that range from 0° to 360° that satisfy the following equations
 $\sin 2x + \cos x = 0$.*

[3 marks]

Jawapan / Answer:

10. (a) Warga emas adalah 20% daripada populasi sebuah penempatan. 10 orang telah dipilih secara rawak daripada penempatan itu. Diberi bahawa varians warga emas ialah 130.

Senior citizens make up 20% of the population of a settlement. 10 people are randomly selected from the settlement. It is given that the variance of the senior citizens is 130.

Cari / find

- (i) kebarangkalian bahawa sekurang-kurangnya dua daripada mereka adalah warga emas
the probability that at least two of them are senior citizens
- (ii) populasi penempatan itu
the population of the settlement

[5 markah]

[5 marks]

- (b) Jisim bagi buah durian dari sebuah ladang mempunyai taburan normal dengan min 2.2 kg dan sisihan piawai 0.9 kg. Hitung

The mass of durians from a farm have a normal distribution with a mean of 2.2 kg and a standard deviation of 0.9 kg. Calculate

- (i) kebarangkalian bahawa sebiji durian yang dipilih secara rawak dari ladang ini mempunyai jisim lebih daripada 1.2 kg
the probability that a durian chosen at random from this farm has a mass of more than 1.2 kg.
- (ii) nilai m jika 87% daripada durian mempunyai jisim kurang daripada m kg
the value of m if 87% of the durian have masses less than m kg.

[5 markah]

[5 marks]

Jawapan / *Answer*:

11. Gunakan kertas graf untuk menjawab soalan ini.

Use graph paper to answer this question

Jadual 2 menunjukkan nilai-nilai pemboleh ubah x dan y , yang diperolehi daripada satu eksperimen. Pemboleh ubah x dan y itu dihubungkan oleh persamaan

$$y = 4px^2 + \frac{p}{q}x, \text{ dengan keadaan } p \text{ dan } q \text{ ialah pemalar.}$$

The table 2 shows the values of variables x and y , obtained from an experiment. The variables x and y are related by the equation $y = 4px^2 + \frac{p}{q}x$ where p and q are constants.

x	2	3	4	5	6	7
y	12.7	21.3	30.9	42.5	55.6	69.9

Jadual 2 / Table 2

- (a) Bina satu jadual bagi nilai-nilai x dan $\frac{y}{x}$.

Construct a table for the values of x and $\frac{y}{x}$

- (b) Menggunakan skala 2 cm kepada 1 unit pada paksi- x dan 2 cm kepada 1 unit pada paksi $\frac{y}{x}$, plotkan graf $\frac{y}{x}$ melawan x . Seterusnya lukis garis lurus penyuaian terbaik

Using a scale of 2 cm to 1 unit on the x -axis and 2 cm to 1 units on the $\frac{y}{x}$ -axis, plot a graph of $\frac{y}{x}$ against x . Hence draw the line of best fit

[3 markah]

[3 marks]

- (c) Gunakan graf di (b) untuk mencari nilai

Use the graph from (b) to find the value of

- (i) y apabila $x = 3.3$

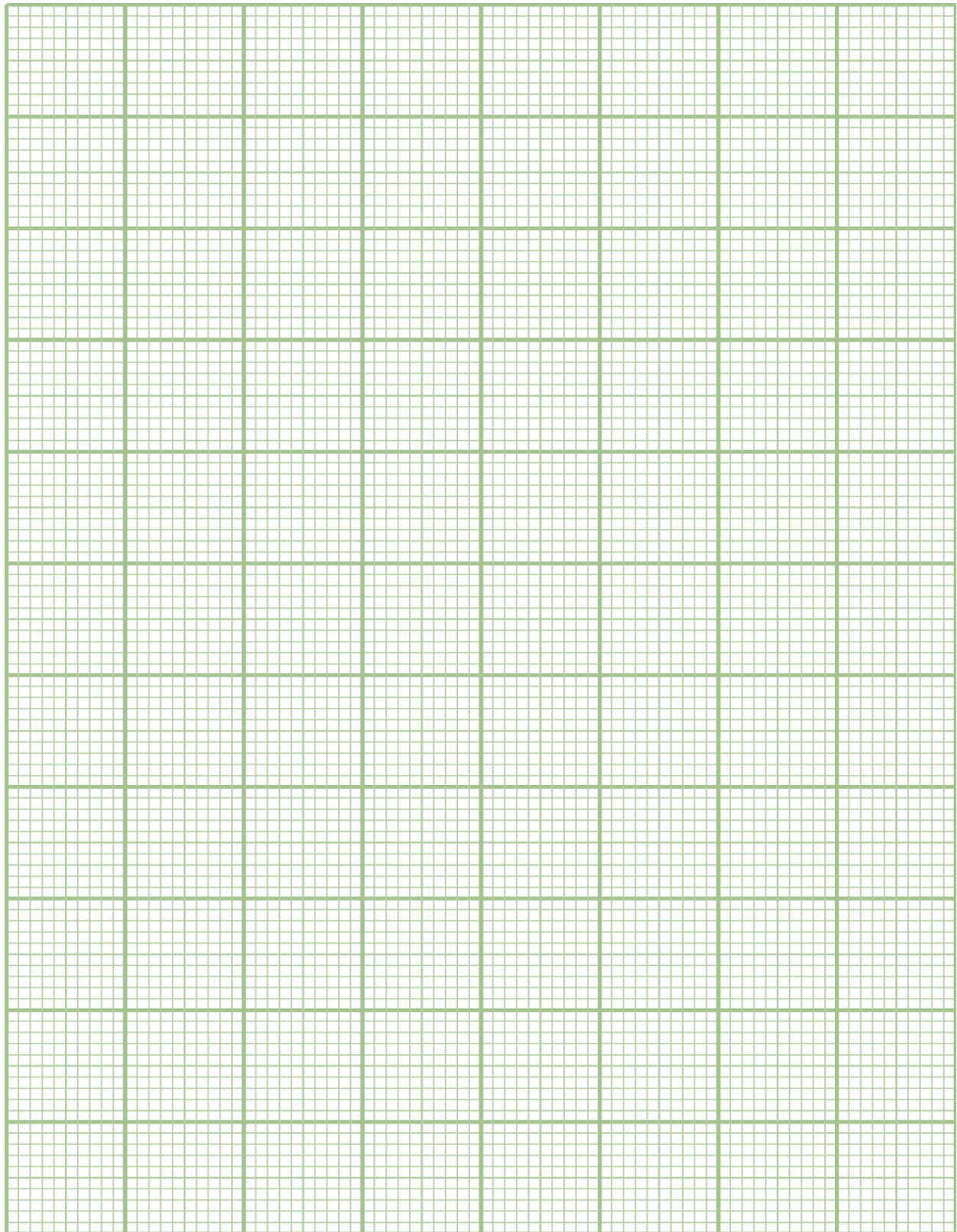
y when $x = 3.3$

- (ii) P

- (iii) q

[5 markah]

[5 marks]



*Bahagian C**Section C*

[20 markah]

[20 marks]

Jawab mana-mana **dua** soalan daripada bahagian ini.

*Answer any **two** questions from this section*

- 12 Satu zarah bergerak di sepanjang suatu garis lurus melalui satu titik tetap O . Halaju zarah itu, $v \text{ ms}^{-1}$, diberi oleh $v = 8 + 2t - t^2$, dengan keadaan t ialah masa, dalam s , selepas melalui O . Cari

A particle moves in a straight line and passes through a fixed point O . The velocity of the particle, $v \text{ m s}^{-1}$, is given by $v = 8 + 2t - t^2$, where t is the time in s , after leaving O .

Find

- (a) halaju awal, dalam ms^{-1} , bagi zarah itu.

the initial velocity, in ms^{-1} , of the particle..

[1 markah]

[1 mark]

- (b) halaju maksimum, dalam cms^{-1} , zarah itu.

the maximum velocity, in cms^{-1} , of the particle [3 markah]

[3 marks]

[3 marks]

- (c) pecutan apabila zarah itu berpatah balik

the acceleration when particle reverse its direction

[3 marks]

[3 marks]

- (d) jumlah jarak yang dilalui dalam 5 saat yang pertama selepas melalui O

the total distance travelled during first 5 second after leaving O .

[5 markah]

[5 marks]

Jawapan / Answer:

13. Empat bahan utama, P , Q , R dan S diperlukan untuk membuat sejenis makanan segera. Jadual 3 di bawah menunjukkan harga setiap bahan.

Four major ingredients, P , Q , R and S are required to make a particular kind of fast food. Table 3 below shows the respective prices of the ingredients.

Bahan <i>Ingredient</i>	Harga/ Price (RM)	
	Tahun/ Year 2020	Tahun/ Year 2021
P	1.60	x
Q	0.90	1.26
R	y	z
S	0.40	0.60

Jadual 3

Table 3

- (a) Indek harga bahan P pada tahun 2021 berasaskan tahun 2020 ialah 125.

Hitung nilai x .

The price index of ingredient P in the year 2021 based on the year 2020 is 125.

Calculate the value of x .

[2 markah]

[2 marks]

- (b) Indek harga bahan R pada tahun 2021 berasaskan tahun 2020 ialah 120. Harganya pada tahun 2021 pula lebih RM0.22 berbanding harganya pada tahun 2020. Hitung nilai y dan z .

The price index of ingredient R in the year 2021 based on the year 2020 is 120.

Its price in the year 2021 is RM0.22 higher than its corresponding price in the year 2020. Calculate the values of y and z .

[3 markah]

[3 marks]

- (c) Indek gubahan kos bagi menghasilkan makanan tersebut pada tahun 2021 berasaskan 2020 ialah 140. Hitung

The composite index for the cost of producing the food in the year 2021 based on the year 2020 is 140. Calculate

- (i) harga satu set makanan segera pada tahun 2020 jika harganya yang sepadan pada tahun 2021 ialah RM7.70.

the price of one set of fast food in the year 2020 if its corresponding price in the year 2021 is RM7.70.

[2 markah]

[2 marks]

- (ii) nilai k jika kuantiti yang diperlukan untuk bahan P , Q , R dan S adalah mengikut nisbah $2 : 2 : 1 : k$.

the value of k if the quantities required for P , Q , R and S are in the ratio $2 : 2 : 1 : k$.

[3 markah]

[3 marks]

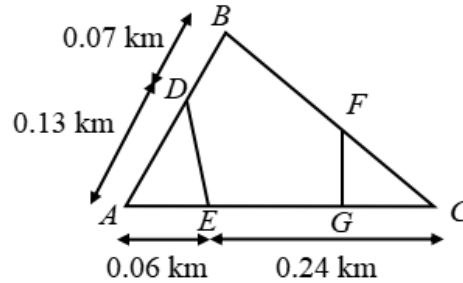
Jawapan / Answer:

- 14 Rajah 5 menunjukkan sebidang tanah berbentuk segi tiga, ABC yang dibahagikan kepada tiga bahagian. ADB , BFC , dan $AEGH$ ialah garis lurus. Diberi $\sin \angle BAC = \frac{12}{13}$.

[Guna $\pi = 3.142$]

Diagram 5 shows a piece of land in a triangle shape, ABC which divided to three parts.

ADB , BFC and $AEGH$ are straight lines. Given $\sin \angle BAC = \frac{12}{13}$. [Use $\pi = 3.142$]



Rajah 5 / Diagram 5

- (a) Hitungkan $\angle DAE$ dalam radian.

Calculate $\angle DAE$ in radian.

[3 markah]

[3 marks]

- (b) Jika pagar hendak didirikan di sepanjang sempadan BC , hitungkan panjang pagar yang diperlukan.

If a fence is to be built along BC , calculate the length of the fence needed.

[2 markah]

[2 marks]

- (c) Diberi bahawa luas $\triangle FGC$ sama dengan luas $\triangle ADE$, hitungkan panjang EG jika panjang FC ialah 0.09 km.

Given the area of $\triangle FGC$ is equal to the area of $\triangle ADE$, calculate the length of EG if the length of FC is 0.09 km.

[5 markah]

[5 marks]

Jawapan / Answer:

15 Gunakan kertas graf untuk menjawab soalan ini.

Use graph paper to answer this question.

Seorang pelukis menghasilkan dua jenis lukisan, H dan K . Sebuah lukisan H mengambil masa 1 jam untuk dilukis dan 20 minit untuk diwarnakan. Sebuah lukisan K mengambil masa 30 minit untuk dilukis dan 40 minit untuk diwarnakan. Dalam sehari, pelukis itu dapat menghasilkan x buah lukisan H dan y buah lukisan K dengan syarat-syarat berikut:

A painter produces two types of drawings, H and K . H drawing takes 1 hour to draw and 20 minutes to colour. K drawing takes 30 minutes to draw and 40 minutes to colour. In a day, the painter can produce x drawings H and y drawings K with the following conditions:

I : Jumlah masa maksimum untuk melukis ialah 12 jam

The maximum amount of time to draw is 12 hours

II : Jumlah masa untuk mewarna selebih-lebihnya 6 jam

Total time for colouring is at most 6 hours

III : Nisbah bilangan lukisan K kepada lukisan H yang dihasilkan ialah tidak lebih 2: 1.

The ratio of the number of drawings K to drawings H produced is not more 2: 1.

(a) Tulis tiga ketaksamaan, selain $x \geq 0$ dan $y \geq 0$, yang memenuhi semua kekangan di atas.

Write down three inequalities, other than $x \geq 0$ and $y \geq 0$, which satisfy all the above constraints.

[3 markah]

[3 marks]

(b) Menggunakan skala 2 cm kepada 2 unit pada kedua-dua paksi, bina dan lorek rantau R yang memenuhi semua kekangan di atas.

Using a scale of 2 cm to 2 unit on both axes, construct and shade the region R that satisfies all the above constraints.

[3 markah]

[3 marks]

(c) Gunakan graf anda di 15 (b), untuk menjawab soalan berikut.

Use your graph from 15 (b), to answer the following questions

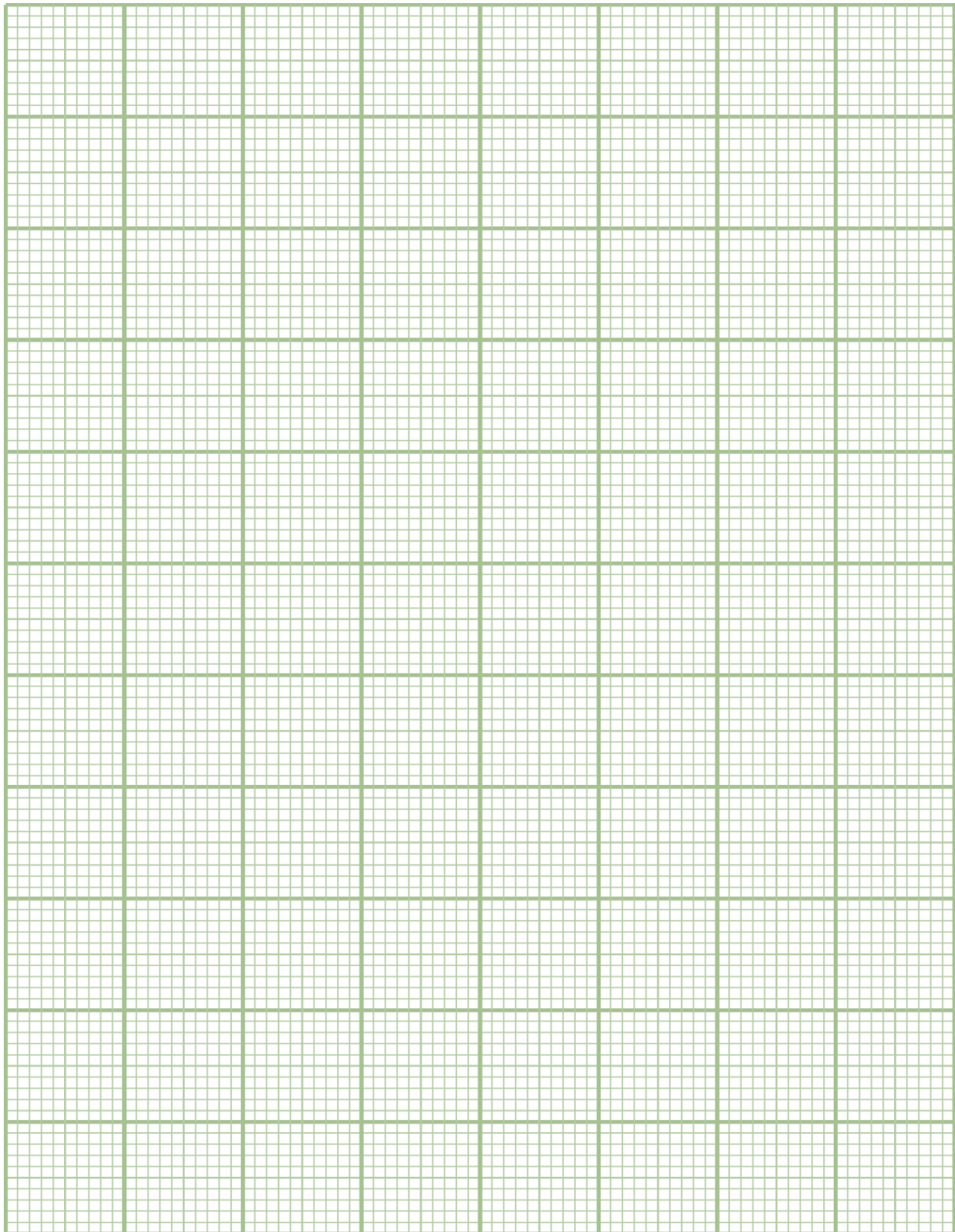
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SULIT

- (i) Cari bilangan lukisan K dihasilkan jika 2 buah lukisan H dihasilkan suatu hari tertentu,
Find the number of K drawings are produced if 2 H drawings are produced on a given day,
- (ii) Dengan menjual lukisan-lukisan yang dihasilkan, pelukis memperoleh untung sebanyak RM20 bagi setiap lukisan H dan RM16 bagi setiap lukisan K . Berapakah jumlah keuntungan maksimum yang diperoleh pelukis itu?
By selling the resulting paintings, the painter earns a profit of RM20 for each painting H and RM16 for each painting K . What is the maximum amount of profit that the painter gets?

[4 markah]

[4 marks]

Jawapan / Answer:



KERTAS SOALAN TAMAT / END OF QUESTION PAPER

3472/2
Percubaan
SPM
Matematik
Tambahan
Kertas 2
Peraturan
Pemarkahan
November
2021

PERCUBAAN SPM TAHUN 2021

**MATEMATIK TAMBAHAN
Tingkatan 5**

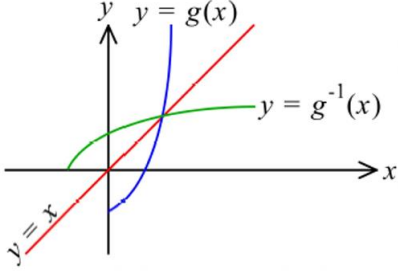
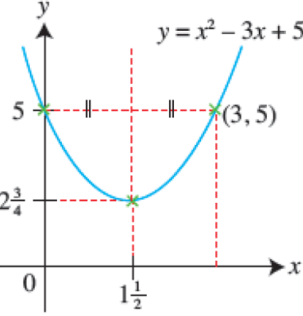
KERTAS 2

PERATURAN PEMARKAHAN

SET 2

UNTUK KEGUNAAN PEMERIKSA SAHAJA

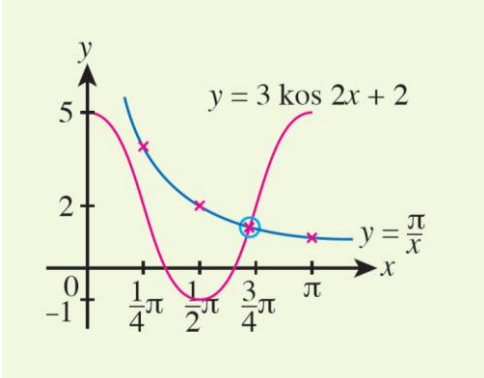
PERATURAN PERMARKAHAN KERTAS 2 SET 2

No	JAWAPAN	MARKAH	
1	(a) 	P1 P1	2
	(b) Garis mengufuk memotong graf $g(x)$ hanya pada satu titik dalam domain yang diberi. Oleh itu $g(x)^{-1}$ wujud	N1 N1	2
	(c) (i) $g(x)^{-1} = \sqrt{2x+1}$ (ii) $-\frac{1}{2} \leq x \leq 4$ $0 \leq g(x)^{-1} \leq 3$	N1 N1 N1	3
		7 M	
2	$x^2 - 3x + \left(-\frac{3}{2}\right)^2 + 5 - \left(-\frac{3}{2}\right)^2$ $\left(x - \frac{3}{2}\right)^2 + \frac{11}{4}$	K1 N1	
	(a) Nilai minimum = $\frac{11}{4}$	N1	
	(b) Nilai minimum wujud bila $\left(x - \frac{3}{2}\right)^2 = 0$ Maka $x = \frac{3}{2}$	N1	
	(c) Koordinat titik minimum = $\left(\frac{3}{2}, \frac{11}{4}\right)$  $(-3)^2 - 4(1)(5) = -11 < 0$ Bentuk Titik minimum Pintasan y dan titik (3,5)	K1 P1 P1 P1	
		8M	

3	(a)	<p>2975 , 2950, 2925, 2900, ... $a = 2975$, $d = -25$</p> $2975 + (n-1)(-25) = 2000$ $n = 40$	P1 K1 N1	3
	(b)	<p>(2975 × 0.15), (2950 × 0.15), (2925 × 0.15), ... $a = 446.25$, $d = -3.75$</p> $S_{40} = \frac{40}{2} [2(446.25) + (40 - 1)(-3.75)]$ $= \text{RM}14\,925$	K1 P1 K1 N1	4
			7M	
4		<p>Katakan $a =$ kilang A $b =$ kilang B $c =$ kilang C.</p> <p>$10a + 20b + 40c = 640 \dots (1)$ • 3 persamaan betul 2M $20a + 15b + 45c = 750 \dots (2)$ • 2 persamaan betul 1M $5a + 35b + 30c = 650 \dots (3)$</p> <p>$(3) \times 2: 10a + 70b + 60c = 1300 \dots (3a)$ • Gunakan kaedah penggantian atau penghapusan 1M $(3) \times 4: 20a + 140b + 120c = 2600 \dots (3b)$ • $a = 12$ hari 1M $(3a) - (1): 5b + 2c = 66 \dots (4)$ • $b = 10$ hari 1M $(3b) - (2): 5b + 3c = 74 \dots (5)$ • $c = 8$ hari 1M $(5) - (4): c = 8$</p> <p>Gantikan nilai $c = 8$ dalam (4) $5b + 2(8) = 66$ $b = 10$</p> <p>Gantikan nilai $c = 8$ dan $b = 10$ dalam (1) $5a + 35(10) + 30(8) = 650$ $a = 12$</p>	P1 P1 K1 N1 N1 N1	
			6	

5	(a)	$\frac{\log_2 125}{\log_2 8} = \log_2 u$ $\log_2 (5^3)^{\frac{1}{3}} = \log_2 u$ $u = 5$	K1 K1 N1	3	
	(b)	$\frac{1}{2}(9\sqrt{3} - 1) = \frac{1}{2}\left(2\sqrt{3} + \frac{1}{2}\right)(h)$ $h = \frac{\frac{1}{2}(9\sqrt{3} - 1)}{\sqrt{3} + \frac{1}{2}} \times \frac{\sqrt{3} - \frac{1}{2}}{\sqrt{3} - \frac{1}{2}}$ $\frac{11}{4}(5 - \sqrt{3}) \times \frac{4}{11}$ $5 - \sqrt{3}$	K1 K1 K1 N1	4	
			7		
6	(a)	<p>(i) $\vec{MB} = \vec{MO} + \vec{OB}$ $= -2\vec{a} + 8\vec{b}$</p> <p>(ii) $\vec{AP} = \alpha(\vec{AO} + \vec{ON})$ $= \alpha\left(-4\vec{a} + \frac{5}{8}(8\vec{b})\right)$ $= -4\alpha\vec{a} + 5\alpha\vec{b}$</p> <p>(iii) $\vec{MP} = \vec{MA} + \vec{AP}$ $= 2\vec{a} - 4\alpha\vec{a} + 5\alpha\vec{b}$ $= (2 - 4\alpha)\vec{a} + 5\alpha\vec{b}$</p>	<ul style="list-style-type: none"> Hukum segitig di gunakan Di (i), (ii) atau (iii)P 1 M 	K1 N1 K1 N1 N1	5
	(b)	<p>Katakan $\vec{MP} = \mu\vec{MB}$ $(2 - 4\alpha)\vec{a} + 5\alpha\vec{b} = -2\mu\vec{a} + 8\mu\vec{b}$ Bandingkan pekali \vec{a} dan \vec{b} :</p> <p>$(2 - 4\alpha) = -2\mu, \quad \rightarrow (1)$</p> <p>$5\alpha = 8\mu, \quad \mu = \frac{5}{8}\alpha \rightarrow (2)$</p> <p>Gantikan (2) dalam (1): $\alpha = \frac{8}{11}$</p>	<ul style="list-style-type: none"> Bandingkan pekali 1m Selesaikan persamaan 1M 	K1 K1 N1	3
			8		

7	(a)	$m_A m_B = -1$ $m_B = \frac{-6 - 8}{2 - 3} = 14$ $m_A = \frac{-1}{14}$ $y - 5 = \frac{-1}{14}(x - (-1))$ $14y + x = 69$	K1 K1 N1	3
	(b)	$\frac{1}{2} \left \begin{array}{ccc c} -3 & 0 & 6 & -3 \\ 4 & 0 & -2 & 4 \end{array} \right $ <p>9</p>	K1 N1	2
	(c)	$\left(\frac{(-3 \times 2) + (3 \times 6)}{3 + 2}, \frac{(4 \times 2) + (-2 \times 3)}{3 + 2} \right)$ $\left(\frac{12}{5}, \frac{2}{5} \right)$	K1 N1	2
				7
8	(a)	<p>i) $0 = 27 - (x - 2)^3$</p> $-27 = -(x - 2)^3$ $3^3 = (x - 2)^3$ <p>$x = 5$ koordinat (5,0)</p> <p>ii) $\int_0^5 27 - (x - 2)^3 dx$</p> $\left[27x - \frac{(x - 2)^4}{4} \right]_0^5$ $\left[27(5) - \frac{((5) - 2)^4}{4} \right]_0^5 - 0$ <p>115.25 unit²</p>	K1 K1 N1 K1 K1 N1	3 3

	(b)	$\pi \int_k^4 (\sqrt{3x+4})^2 dx = \pi \int_k^4 3x+4 dx = 26\pi$ $\pi \left[\frac{3x^2}{2} + 4x \right]_k^4 = 26\pi$ $\left[\frac{3(4)^2}{2} + 4(4) \right] - \left[\frac{3(k)^2}{2} + 4(k) \right] = 26$ $-3k^2 - 8k + 28 = 0$ $k = 2$	K1 K1 K1 N1	4												
			10													
9	(a)	$\sin 90^\circ \cos A + \cos 90^\circ \sin A$ $(1)\cos A + (0)\sin A$	K1 N1	2												
	(b)	<table border="1" data-bbox="245 1137 1066 1285"> <tbody> <tr> <td>x</td> <td>0</td> <td>$\frac{\pi}{4}$</td> <td>$\frac{\pi}{2}$</td> <td>$\frac{3\pi}{4}$</td> <td>π</td> </tr> <tr> <td>y</td> <td>5</td> <td>2</td> <td>-1</td> <td>2</td> <td>5</td> </tr> </tbody> </table>  $3x \cos 2x + 2x = \pi$ $x(3 \cos 2x + 2) = \pi$ $3 \cos 2x + 2 = \frac{\pi}{x}$ $y = \frac{\pi}{x}$ <p>Bilangan penyelesaian = 1</p>	x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	y	5	2	-1	2	5	P1 P1 P1 K1 N1	5
x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π											
y	5	2	-1	2	5											

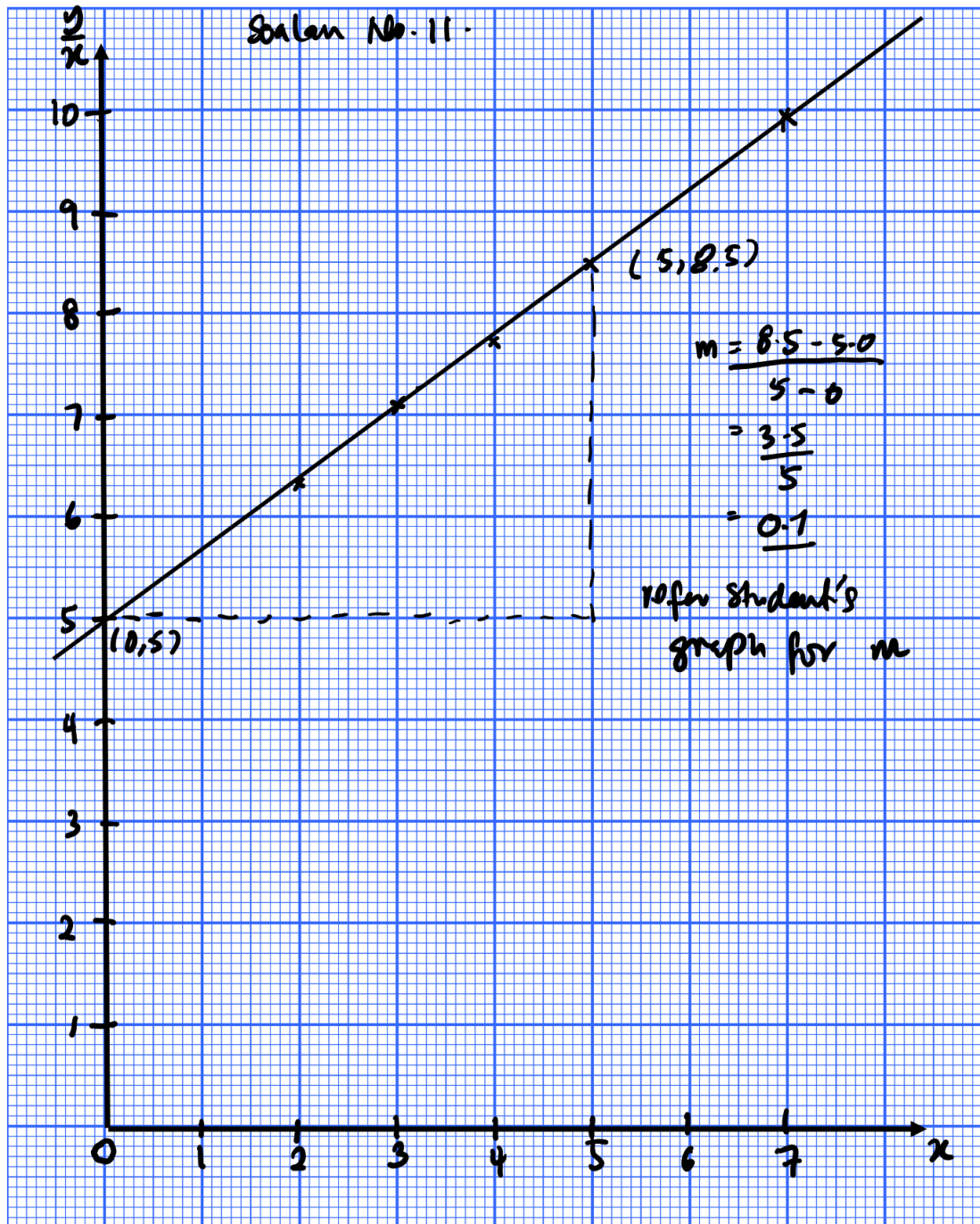
	(c)	$\cos x(2\sin x + 1) = 0$ $\cos x = 0, \quad 2\sin x + 1 = 0$ $x = 90^\circ, \quad x = 270^\circ$ $x = 180^\circ + 30^\circ, \quad x = 360^\circ - 30^\circ$	K1 N1 N1	3
			10	
NO	JAWAPAN		MARKAH	
10	(a)(i)	$p=0.2$ atau $q=0.8$ $P(X \geq 2) = 1 - P(X=0) - P(X=1)$ $= 1 - {}^{10}C_0(0.2)^0(0.8)^{10} - {}^{10}C_1(0.2)(0.8)^9$ $= 0.6242$ Atau setara	P1 K1 NI	5
	(ii)	$130 = n(0.2)(0.8)$ $n = 813$	K1 N1	
	(b)(i)	$P(X > 1.2)$ $= P\left(Z < \frac{1.2 - 2.2}{0.9}\right)$ $= 0.8667$	K1 NI	5
	(ii)	$P\left(Z < \frac{m-2.2}{0.9}\right) = 0.87$ atau $P\left(Z > \frac{m-2.2}{0.9}\right) = 0.13$ $\frac{m-2.2}{0.9} = 1.126$ $m = 1.126$	K1 K1 N1	
			10	

NO		JAWAPAN	MARKAH															
11	(a)	<table border="1"> <tr> <td>x</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td>$\frac{y}{x}$</td> <td>6.35</td> <td>7.10</td> <td>7.72</td> <td>8.50</td> <td>9.27</td> <td>9.99</td> </tr> </table>	x	2	3	4	5	6	7	$\frac{y}{x}$	6.35	7.10	7.72	8.50	9.27	9.99	N1	1
x	2	3	4	5	6	7												
$\frac{y}{x}$	6.35	7.10	7.72	8.50	9.27	9.99												
	(b)	(correct axes and uniform scales) All points are plotted correctly Line of best fit	P1 P1 P1	3														
	(c)	$\frac{y}{x} = 4px + \frac{p}{q}$ <p>(i) From the graph, when $x = 3.3$</p> $\frac{y}{x} = 7.3$ $y = 24.09$ <p><i>**refer to student's graph</i></p> <p>(ii) Gradient / <i>kecerunan</i>, $4p = 0.7$</p> $p = 0.175$ <p>(iii)</p> $\frac{p}{q} = Y\text{-intercept}$ $\frac{0.175}{q} = 5$ $q = 0.035$	P1 N1 K1 N1 K1 N1	6														
			10															
NO		JAWAPAN	MARKAH															
12	(a)	8	N1															
	(b)	Differentiate $8 + 2t - t^2$ $a = 2 - 2t$ $t = 1$ $v = 9$	K1 N1 N1	4														

	(c)	$8 + 2t - t^2 < 0$ $t > 4$ $a = -6$	K1 N1 N1	3
	(d)	$\int 8 + 2t - t^2$ $s = 8t + t^2 - \frac{t^3}{3}$ Substitute $t = 4$ and $t = 5$ into $s = 8t + t^2 - \frac{t^3}{3}$ 30	K1 K1 N1	3
			10 M	
NO	JAWAPAN		MARKAH	
13	(a)	$\frac{x}{1.6} \times 100 = 125$ $x = \text{RM}2.00$	K1 N1	2
	(b)	$z = y + 0.22$ $\frac{y+0.22}{y} \times 100 = 120$ $y = \text{RM}1.10$ $z = \text{RM}1.32$	K1 N1 N1	3
	(c)	(i) $\frac{7.70}{P_{20}} \times 100 = 140$ $P_{20} = \text{RM}5.50$ (ii) seen 140 or 150 $140 = \frac{(125 \times 2) + (140 \times 2) + (120 \times 1) + (150 \times k)}{2+2+1+k}$ $k = 5$	K1 N1 P1 K1 N1	5
			10	

NO		JAWAPAN	MARKAH	
13	(a)	$\frac{x}{1.6} \times 100 = 125$ $x = \text{RM}2.00$	K1 N1	2
	(b)	$z = y + 0.22$ $\frac{y+0.22}{y} \times 100 = 120$ $y = \text{RM}1.10$ $z = \text{RM}1.32$	K1 N1 N1	3
	(c)	<p>(i) $\frac{7.70}{P_{20}} \times 100 = 140$</p> $P_{20} = \text{RM}5.50$ <p>(ii) seen 140 or 150</p> $140 = \frac{(125 \times 2) + (140 \times 2) + (120 \times 1) + (150 \times k)}{2+2+1+k}$ $k = 5$	K1 N1 P1 K1 N1	
			10 M	
NO		JAWAPAN	MARKAH	
14	(a)	$\angle DAE = \angle BAC$ $\angle BAC = \sin^{-1} \frac{12}{13}$ $= \frac{67.38^\circ}{180^\circ} \times 3.142$ $= 1.176 \text{ rad}$	K1 K1 N1	3
	(b)	$BC^2 = 0.2^2 + 0.3^2 - 2(0.2)(0.3) \cos 67.38^\circ$ $= 0.194 \text{ km}$	K1 N1	2
	(c)	$\Delta ADE = \frac{1}{2} (0.13)(0.06) \sin 67.38^\circ$ $= \frac{9}{2500} \text{ km}^2 / 3.6 \times 10^{-3} \text{ km}^2$	K1 N1	

		$\frac{\sin C}{0.2} = \frac{\sin 67.38^\circ}{0.194}$ $\angle BCA = 72.106^\circ$ $\frac{9}{2500} = \frac{1}{2} \times GC \times 0.09 \times \sin 72.106^\circ$ $GC = 0.084 \text{ km}$ $EG = 0.24 - 0.084$ $= 0.156 \text{ km}$	K1 K1 N1	
			10 M	
15	(a)	$2x + y \leq 24$ $x + 2y \leq 18$ $y \leq 2x$	N1 N1 N1	3
	(b)	Rujuk lampiran graf 3 Garis dan kawasan berlorek betul	K1 N1 N1	3
	(c)	Bilangan – 4 $(10,4)$ $20(10) + 16(4) = k$ $RM 264$	N1 N1 K1 N1	4



Soalan No 15 (b)

