

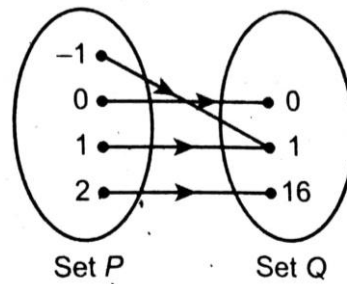
SOALAN PEPERIKSAAN PERCUBAAN SPM 2021

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,

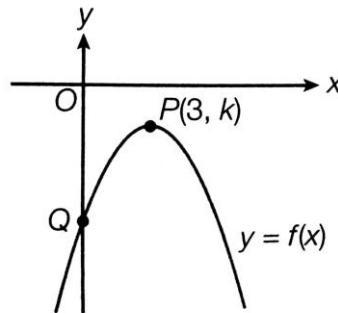
iii) f^2

[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.

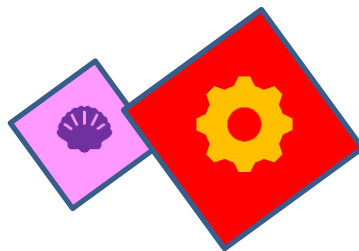
The following sequence of numbers shows the number of people who received an injection of Covid-19 vaccine in a vaccination centre every day for a specified period. Find the number of vaccine recipients during that period.

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.

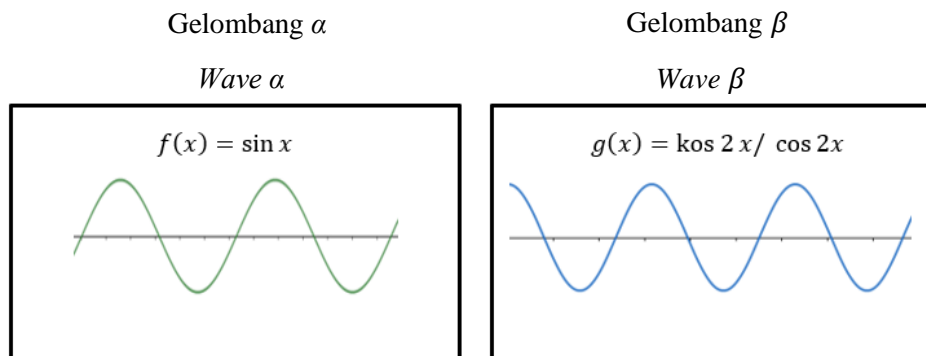
Given that the sum of the perimeters of both tiles is 32 cm while the sum of the areas of both tiles is 34 cm^2 . Find the length of sides of each tile.

[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]

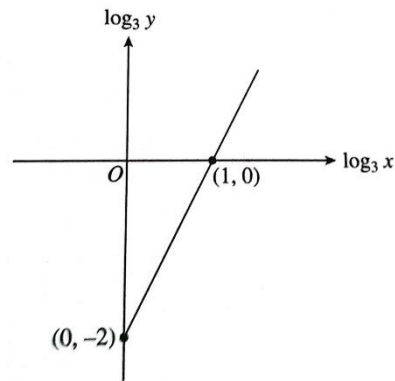
- (b) Diberi bahawa $\tan(A - B) = \frac{12}{5}$ dan $\tan A = \frac{2}{3}$, cari $\tan B$.

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.

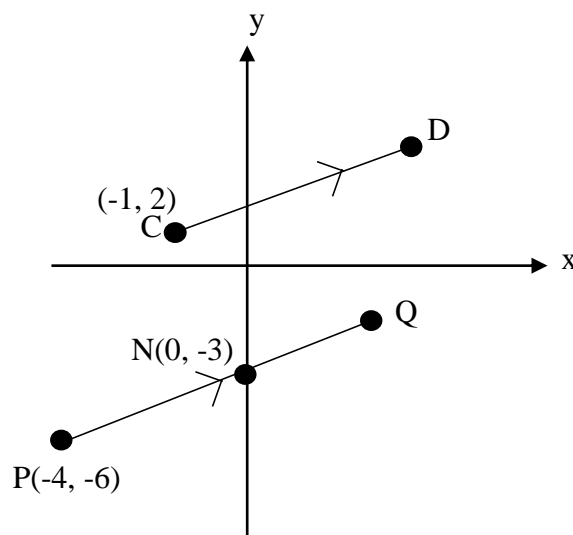
If the strawberry, chocolate and lemon flavored ice creams are displayed, find the number of different mixed flavours of ice creams can be chosen by a buyer.

[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:

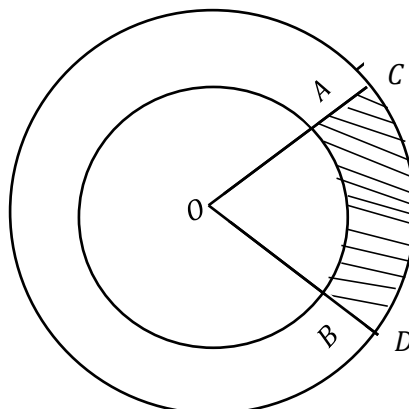
- 13 (a) Seutas dawai dibengkokkan untuk membentuk sebuah sektor bulatan dengan pusat O dan berjari 6 cm. Jika luas sector ialah 18 cm^2 , cari panjang, dalam cm, dawai itu.

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