

Nama : _____

Kelas: _____

SULIT
3472/1
Matematik
Tambahan
PCN 2020
2 Jam



SEKOLAH MENENGAH KEBANGSAAN MERBOK
08400 MERBOK, KEDAH DARUL AMAN

PEPERIKSAAN PERCUBAAN 2020

MATEMATIK TAMBAHAN TINGKATAN 5

MASA: 2 JAM

**JANGAN BUKA KERTAS SOALAN INI
SEHINGGA DIBERITAHU**

1. Tulis nama penuh dan kelas anda pada ruangan yang disediakan.
2. Kertas soalan ini mengandungi **25** soalan. Jawab **semua** soalan.
3. Langkah-langkah pengiraan dapat membantu anda mendapatkan markah.
4. Kalkulator saintifik yang tidak boleh diprogramkan boleh digunakan.

Disediakan Oleh

Disemak Oleh

.....
HARIS FADZLI BIN AWANG
Ketua Panitia Matematik Tambahan

.....
NOR LIZA BT MISBAN
GKM Sains & Matematik

Disahkan Oleh

.....

<i>Untuk Kegunaan Pemeriksa</i>		
Soalan	Markah Penuh	Markah Diperoleh
1	2	
2	3	
3	3	
4	4	
5	3	
6	2	
7	3	
8	4	
9	4	
10	3	
11	3	
12	4	
13	4	
14	3	
15	3	
16	2	
17	3	
18	4	
19	3	
20	4	
21	4	
22	4	
23	3	
24	2	
25	3	
JUMLAH	80	

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

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

ALGEBRA

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

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

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

$$4. \quad (a^m)^n = a^{m \cdot n}$$

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

$$6. \quad \log_a \frac{m}{n} = \log_a m - \log_a n$$

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

$$8. \quad \log_a b = \frac{\log_c b}{\log_c a}$$

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

$$10. \quad S_n = \frac{n}{2} \{2a + (n-1)d\}$$

$$11. \quad T_n = ar^{n-1}$$

$$12. \quad S_n = \frac{a(r^n - 1)}{r - 1} = \frac{a(1 - r^n)}{1 - r}, \quad r \neq 1$$

$$13. \quad S_\infty = \frac{a}{1 - r}, \quad |r| < 1$$

CALCULUS / KALKULUS

$$1. \quad y = uv$$

$$\frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$$

$$2. \quad y = \frac{u}{v}, \quad \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

$$3. \quad \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

$$4. \quad \text{Area under a curve} \\ \text{Luas di bawah lengkung}$$

$$= \int_a^b y \, dx \quad \text{or / atau}$$

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

$$5. \quad \text{Volume generated} \\ \text{Isipadu janaan}$$

$$= \int_a^b \pi y^2 \, dx \quad \text{or / atau}$$

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

STATISTICS / STATISTIK

$$1. \quad \bar{x} = \frac{\sum x}{N}$$

$$2. \quad \bar{x} = \frac{\sum fx}{\sum f}$$

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

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

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

$$6. \quad I = \frac{Q_1}{Q_0} \times 100$$

$$7. \quad \bar{I} = \frac{\sum W_i I_i}{\sum W_i}$$

$$8. \quad {}^n P_r = \frac{n!}{(n-r)!}$$

$$9. \quad {}^n C_r = \frac{n!}{(n-r)! r!}$$

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

$$11. \quad p(X=r) = {}^n C_r p^r q^{n-r}, \quad p+q=1$$

$$12. \quad \text{Mean} / \text{Min} = np$$

$$13. \quad \sigma = \sqrt{npq}$$

$$14. \quad Z = \frac{X - \mu}{\sigma}$$

GEOMETRI (GEOMETRY)

1. Distance / Jarak

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

2. Midpoint / Titik tengah

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

3. A point dividing a segment of a line
Titik yang membahagi suatu tembereng garis

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

4. Area of triangle / Luas segi tiga

$$\frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

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

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

TRIGONOMETRY / TRIGONOMETRI

1. Arc length, $s = r\theta$

Panjang lengkok, $s = j\theta$

2. Area of sector $= \frac{1}{2} r^2 \theta$

Luas sektor, $L = \frac{1}{2} j^2 \theta$

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

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

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

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

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

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

6. $\sin 2A = 2 \sin A \cos A$

$\sin 2A = 2 \sin A \cos A$

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

$= 2 \cos^2 A - 1$

$= 1 - 2 \sin^2 A$

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

$= 2 \cos^2 A - 1$

$= 1 - 2 \sin^2 A$

8. $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$

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

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

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

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

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

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

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

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

14. Area of triangle / *Luas segi tiga*

$= \frac{1}{2} ab \sin C$

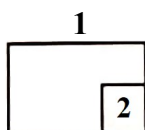
1. Given $f(x) = \frac{2}{3+x}, x \neq p$, Find the value of

Diberi $f(x) = \frac{2}{3+x}, x \neq p$, Cari nilai

a) p

b) $f(1)$

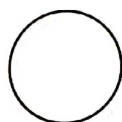
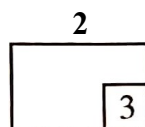
[2 marks/markah]



2. Find the range of values of x for which $2x^2 \leq 1 + x$

Cari julat nilai x bagi $2x^2 \leq 1 + x$

[3 marks/markah]

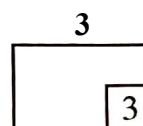


3. The speed of a particle, $v \text{ ms}^{-1}$ travelling from point Y to Z, at time t seconds after leaving Y is given by $v = 6t - t^2$. The particle starts from rest at Y and comes to rest at Z. Find the time interval when the particle has a speed greater than 5 m s^{-1} .

Halaju suatu zarah, $v \text{ ms}^{-1}$ bergerak dari titik Y ke titik Z, pada masa t saat selepas melalui titik Y diberikan oleh $v = 6t - t^2$. Zarah bermula dari rehat pada titik Y dan berhenti untuk rehat pada titik Z. Cari julat masa apabila zarah mempunyai halaju lebih besar daripada 5 m s^{-1} .

[3 marks/markah]

Untuk Kegunaan
Pemeriksa

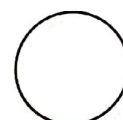
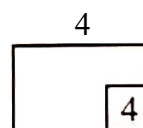


4. Solve the equations:
Selesaikan persamaan:

a) $27^{-\log_3 y} = 64$

b) $\log_{125} [\log_3 (5x - 7)] = \frac{1}{3}$

[4 marks/markah]



5.

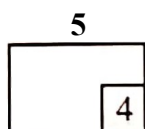
In an arithmetics progression, the sum of the first n terms is given by

$$S_n = \frac{9n - 3n^2}{2}. \text{ Find the sum of terms from the 6}^{\text{th}} \text{ term to the 18}^{\text{th}} \text{ term.}$$

Dalam suatu jangjang aritmetik, hasil tambah n sebutan pertama diberi oleh

$$S_n = \frac{9n - 3n^2}{2}. \text{ Cari hasil tambah sebutan ke-6 hingga sebutan ke-18.}$$

[4 marks/markah]



6.

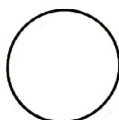
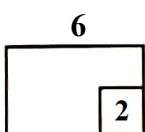
It is given that 6, 18, h , and k are the four terms of a geometric progression.

Find the value of k .

Diberi bahawa 6, 18, h , dan k ialah empat sebutan pertama bagi suatu jangjang geometri.

Cari nilai k .

[2 marks/markah]



7. Diagram 6 shows the first 3 sets of squares built from matchsticks.
Rajah 6 menunjukkan 3 set pertama segi empat sama yang dibina daripada beberapa batang mancis.

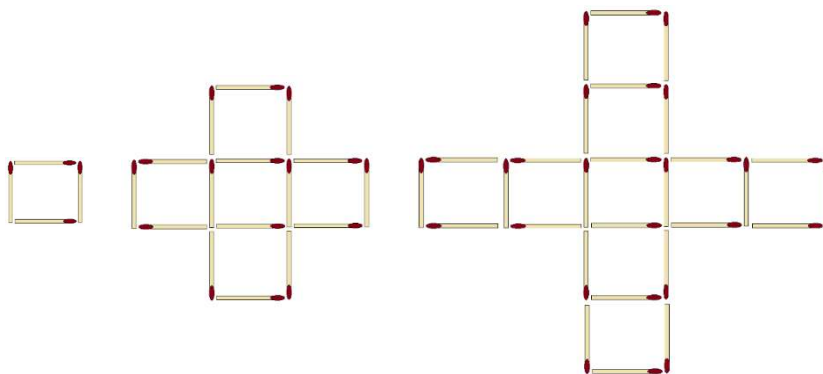


Diagram 6

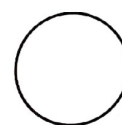
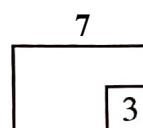
Rajah 6

Find the maximum number of set squares that can be formed using 580 matchsticks.

Cari bilangan maksimum set segi empat sama yang boleh dibentuk menggunakan 580 batang mancis.

[3 marks/markah]

*Untuk Kegunaan
Pemeriksa*



8.

The price p , in RM of an item and the quantity x sold follow the demand

equation $p = 100 - \frac{1}{4}x$ for $0 \leq x \leq 400$. Whereas the cost C , in RM to

produce x units is $c = \frac{\sqrt{x}}{25} + 600$. Assuming all the items produced are sold,

calculate

Harga p , dalam RM, bagi suatu barangan dan kuantiti x yang dijual

mengikut persamaan $p = 100 - \frac{1}{4}x$ for $0 \leq x \leq 400$. Manakala kos C ,

dalam RM untuk mengeluarkan x unit ialah $c = \frac{\sqrt{x}}{25} + 600$. Anggapkan

semua barangan yang dikeluarkan terjual, hitung

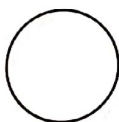
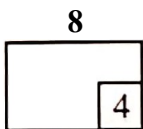
a) The cost C as a function of price p

Kos C sebagai fungsi bagi harga p

b) The cost for producing that item if the price for one unit of the item is sold at RM36.

Kos untuk mengeluarkan barangan itu jika harga untuk satu unit barang dijual dengan harga RM 36.

[4 marks/markah]



9. Diagram 9 shows a rectangular billboard painted with white color.
Rajah 14 menunjukkan sebuah papan tanda berbentuk segi empat tepat yang dicat dengan warna putih.



Diagram 9

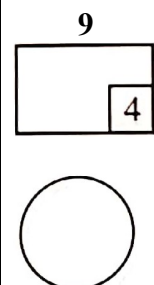
Rajah 9

The billboard is of length $3x$ m and width $(5 - x)$ m. 20 cylindrical cans of paint with radius 8 cm and height of 13.43 cm are used to paint the billboard with 0.612 cm^3 of paints remain in each can. Assuming the thickness of the paint is 0.3 cm, calculate the values of x . [Take $\pi = 3.142$]

Papan tanda tersebut sepanjang $3x$ m dan $(5 - x)$ m lebar. Sebanyak 20 tin cat berbentuk silinder dengan jejari 8 cm dan tingginya 13.43 cm diperlukan untuk mengecat papan tanda tersebut dengan lebihan cat bagi setiap tin ialah 0.612 cm^3 . Dengan mengandaikan ketebalan cat ialah 0.3 cm, hitungkan nilai-nilai x . [Guna $\pi = 3.142$]

[4 marks/markah]

*Untuk Kegunaan
Pemeriksa*



10.

Diagram 10 shows location of a school hall, a canteen and a Science Lab of SMK Jujur.

Rajah 10 menunjukkan lokasi dewan sekolah, kantin dan makmal sains bagi SMK Jujur.

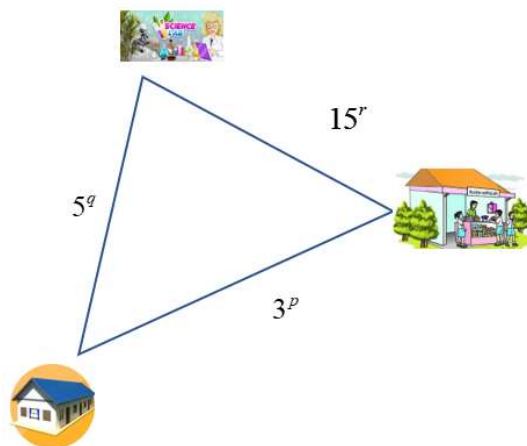


Diagram 10

Rajah 10

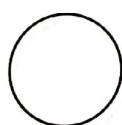
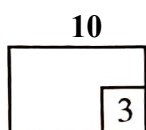
School hall, canteen and Science Lab are equidistance to each other.

Express r in the form of p and q .

Dewan sekolah, kantin dan makmal sains berjarak sama antara satu sama lain.

Ungkapkan r dalam sebutan p dan q

[3 marks/markah]



11. Diagram 11 shows a long bamboo ladder PQ which is leaning against a wall.
Rajah 11 menunjukkan sebatang tangga buluh PQ yang disandarkan pada sebuah dinding.

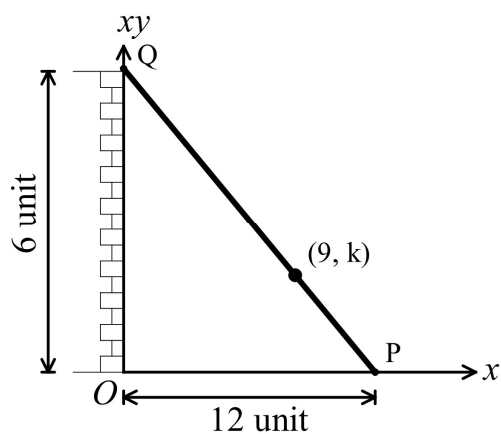
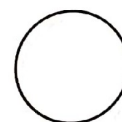
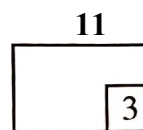


Diagram 11
Rajah 11

- Express y in terms of x ,
Ungkapkan y dalam sebutan x ,
- Find the value of k
Cari nilai k

[3 marks/markah]

Untuk Kegunaan
 Pemeriksa



12.

Diagram 12 shows two circles intersect at C and D. A and B are the center of the two circles, each with radius of 6 cm respectively.

Rajah 12 menunjukkan dua bulatan yang bersilang pada C dan D. A dan B adalah pusat kedua-dua bulatan, masing-masing dengan jejari 6 cm.

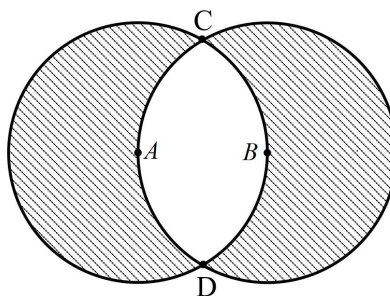


Diagram 12

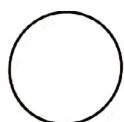
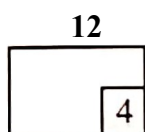
Rajah 12

By using $\pi = 3.142$, find,

Dengan menggunakan $\pi = 3.142$, cari

- a) $\angle CBD$ in radians,
 $\angle CBD$ dalam radian
- b) area of the shaded region.
luas kawasan berlorek.

[4 marks/markah]

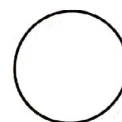
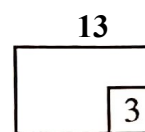


13. Find the area enclosed by the equation $6|x| + 2|y| = 18$.

Cari luas kawasan yang dibatasi oleh persamaan $6|x| + 2|y| = 18$

[4 marks/markah]

*Untuk Kegunaan
Pemeriksa*



14. Diagram 14 shows a straight line PQ which divides the line segment joining the points A and B in the ratio of 3 : 2 .

Rajah 5 menunjukkan satu garis lurus PQ membahagi tembereng garis yang menyambungkan titik-titik A dan B pada nisbah 3 : 2 .

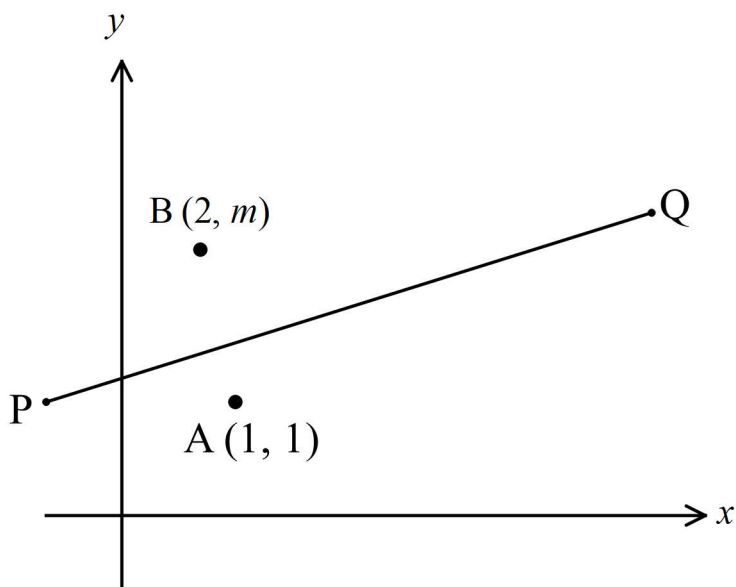


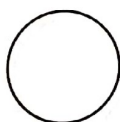
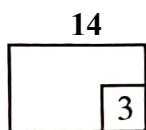
Diagram 5

Rajah 5

Given the equation of PQ is $2x + y = k$, express m in terms of k .

Diberi persamaan PQ ialah $2x + y = k$, ungkapkan m dalam sebutan k .

[3 marks/markah]



15. Diagram 1 shows an aircraft carrier and two of its battleships. The position of battleship A, battleship B and enemy's battleship from the aircraft carrier is given by $3\hat{i} + 2\hat{j}$, $4\hat{i} + 5\hat{j}$ and $5\hat{i} + 7\hat{j}$ respectively. [Assuming that the aircraft carrier is the origin].

Rajah 1 menunjukkan sebuah kapal pengangkut pesawat dan dua dari kapal perangnya. Kedudukan kapal perang A, kapal perang B dan kapal perang musuh dari kapal pengangkut jet pejuang masing-masing ialah $3\hat{i} + 2\hat{j}$, $4\hat{i} + 5\hat{j}$ dan $5\hat{i} + 7\hat{j}$. [Anggapkan kapal pengangkut jet pejuang sebagai asalan]

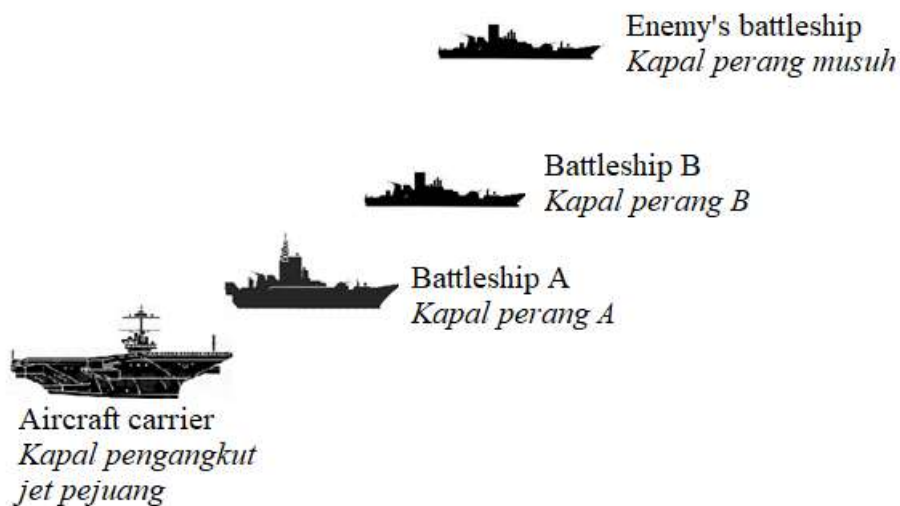


Diagram 1
Rajah 1

Battleship A has released a torpedo towards its enemy, determine whether battleship B has been hit. [Assuming the torpedo moves in a straight line].

Kapal perang A telah melepaskan torpedo ke arah kapal perang musuh, tentukan sama ada kapal perang B terkena tembakan tersebut.

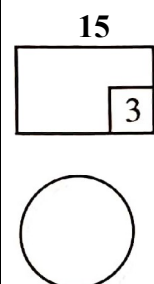
[Anggapkan torpedo bergerak lurus]

Prove your answer mathematically

Buktikan jawapan anda secara matematik.

[3 marks/markah]

Untuk Kegunaan
Pemeriksa

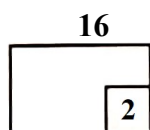


16. Vector $\underline{a}$ and vector $\underline{b}$ are parallel vectors but in opposite direction. Given $|2k - h|\underline{a} = 5\underline{b}$
Vektor $\underline{a}$ dan vektor $\underline{b}$ adalah selari tetapi bertentangan arah. Diberi $|2k - h|\underline{a} = 5\underline{b}$.

Express k in term of h

Ungkapkan k dalam sebutan h .

[2 marks/markah]



17. While measuring the radius of a sphere, Kamal made a 3% of error.
Find the percentage of error in the volume of the sphere.

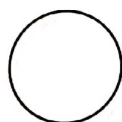
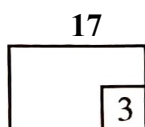
[Given $V_{\text{sphere}} = \frac{4}{3}\pi r^3$]

Semasa mengambil ukuran jejari bagi sebuah sfera, Kamal telah melakukan kesilapan ukuran sebanyak 3%.

Cari peratus kesilapan dalam isipadu sfera tersebut.

[Diberi $V_{\text{sphere}} = \frac{4}{3}\pi r^3$]

[3 marks/markah]



18. Given $\int_1^4 g(x)dx = p$.

Diberi $\int_1^4 g(x)dx = p$.

Find in terms of p for

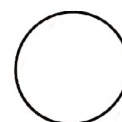
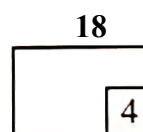
Cari dalam sebutan p bagi

a) $\int_4^1 \frac{3g(x)}{5} dx$

b) $\int_1^4 [4 + g(x)]dx$

[4 marks/markah]

Untuk Kegunaan
Pemeriksa



19. Diagram 6 shows a curve $y = \frac{5}{x^2}$.

Rajah 6 menunjukkan lengkung $y = \frac{5}{x^2}$

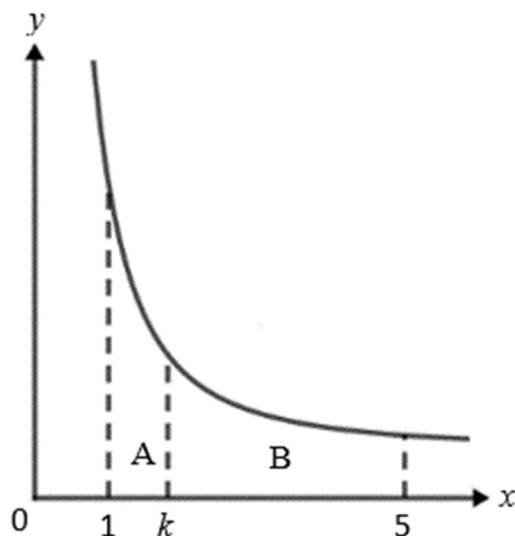


Diagram 6

Rajah 6

The area of region A is equal to the area of region B.

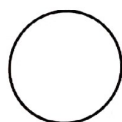
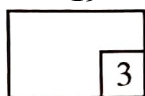
Find the value of k .

Luas kawasan A adalah sama dengan luas kawasan B.

Cari nilai k .

[3 marks/ markah]

19



20. The probability of Redwan being chosen to participate in a debate competition is $\frac{4}{5}$ while Kumar being chosen is k . The probability none of them are chosen to participate in the debate competition is $\frac{1}{15}$, find

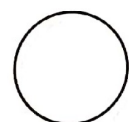
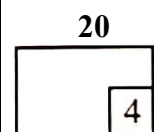
Kebarangkalian Redwan dipilih untuk menyertai pertandingan perbahasan ialah $\frac{4}{5}$ manakala kebarangkalian Kumar dipilih ialah k . Kebarangkalian untuk tiada seorang dipilih untuk menyertai pertandingan tersebut ialah $\frac{1}{15}$, cari

- a) the value of k
nilai k ,
- b) the probability that only one of them is chosen to participate in the debate competition.

kebarangkalian bahawa hanya seorang daripada mereka dipilih untuk menyertai pertandingan perbahasan itu.

[4 marks/markah]

*Untuk Kegunaan
Pemeriksa*



21.

Diagram 21 shows a graph of trigonometric function which represented $y = f(x)$

Rajah 21 menunjukkan satu graf fungsi trigonometri yang diwakili oleh $y = f(x)$

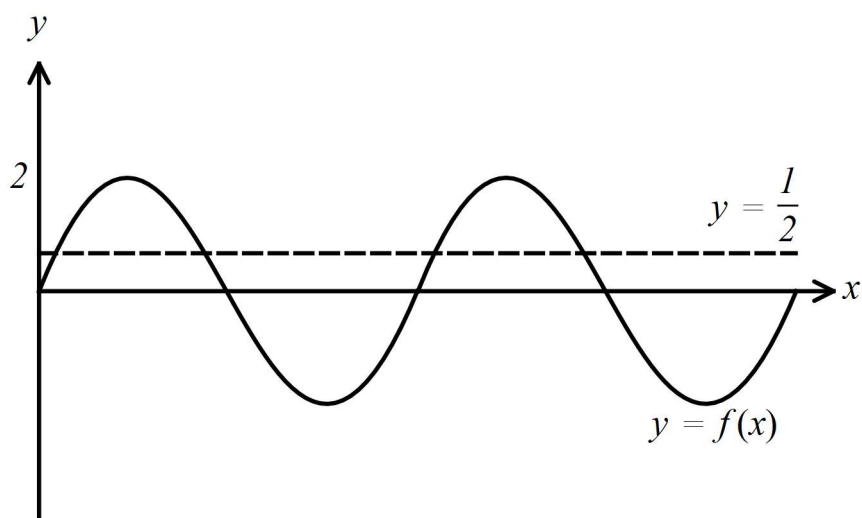


Diagram 21

Rajah 21

Find All the values of x when the straight line $y = \frac{1}{2}$ touches the function

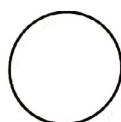
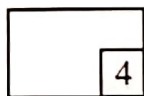
$y = f(x)$ in the domain of $0^\circ \leq x \leq 360^\circ$

Cari semua nilai x apabila garis $y = \frac{1}{2}$ menyentuh fungsi $y = f(x)$ dalam

domain $0^\circ \leq x \leq 360^\circ$

[4 marks/markah]

21



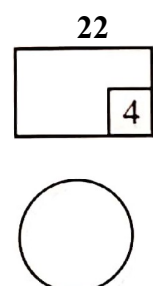
22. 5 students are to be chosen from a group of 5 girls and 5 boys to represent the school in a Mathematics competition. Calculate the number of different teams that can be formed if each team consist of

5 orang murid akan dipilih daripada sekumpulan 5 orang murid perempuan dan 5 orang murid lelaki untuk mewakili sekolah dalam suatu pertandingan Matematik. Hitung bilangan pasukan berlainan yang boleh dibentuk jika setiap pasukan terdiri daripada

- (a) 3 boys and 2 girls,
3 orang murid lelaki dan 2 orang murid perempuan
- (b) at least 3 girls.
sekurang-kurangnya 3 orang murid perempuan

[4 marks/markah]

*Untuk Kegunaan
Pemeriksa*



23. A Set of six data has a mean of 9 and the sum of squares is 1250. If the number 7 is removed from the set of data, find the standard deviation of the remaining set of data.

Satu set enam data mempunyai min 9 dan hasil tambah kuasa dua ialah 1250. Jika nombor 7 dikeluarkan dari set data itu, cari sisihan piawai bagi set data tinggal.

[3 marks/markah]

23

3

24. A random variable, $X \sim B(n, p)$ has a binomial distribution with 8 trials where the probability of success in each trial is p . The mean number of success is 4. Find the value of p .

Pemboleh ubah rawak, $X \sim B(n, p)$ mengikut suatu taburan binomial dengan 8 percubaan di mana kebarangkalian kejayaan dalam setiap cubaan ialah p .

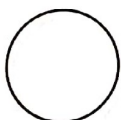
Min bagi bilangan kejayaan ialah 4.

Hitung nilai p .

[2 marks/markah]

24

2



25. The masses of bags of paddy, in kg, are normally distributed with a mean of μ and a standard deviation of σ . Given that 2.28 % of the bags of paddy have masses of more than 50 kg and 16.60% have masses of less than 32.18 kg. Find the value of μ and of σ .

Jisim bagi beg-beg berisi padi, dalam kg, bertabur secara normal dengan min μ dan sisihan piawai σ . Diberi bahawa 2.28 % daripada beg berisi padi mempunyai jisim melebihi 50 kg dan 16.60% mempunyai jisim kurang daripada 32.18 kg.

Cari nilai μ dan nilai σ .

[3 marks/markah]

