

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

**ALGEBRA**

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

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

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

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

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

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

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

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

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

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

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

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

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

**CALCULUS**

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

$$4 \quad \text{Area under a curve} = \int_a^b y \, dx \quad \text{or} \quad \int_a^b x \, dy$$

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

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

5 Volume generated

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

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

[Lihat halaman sebelah  
SULIT

STATISTICS

1  $\bar{x} = \frac{\Sigma x}{N}$

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

2  $\bar{x} = \frac{\Sigma fx}{\Sigma f}$

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

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

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

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

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

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

12 Mean = np

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

13  $\sigma = \sqrt{npq}$

7  $\bar{I} = \frac{\Sigma W_i I_i}{\Sigma W_i}$

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

GEOMETRY

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

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

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

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

3 A point dividing a segment of a line  
(x, y) =

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

4 Area of a triangle =

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

**TRIGONOMETRY**

1 Arc length,  $s = r\theta$

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

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

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

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

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

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

1. Given set  $A = \{9, 36, 49, 64\}$  and set  $B = \{-6, 3, 4, 7, 8\}$ . The relation from set  $A$  to set  $B$  is "the square root of ", state  
*Diberi set  $A = \{9, 36, 49, 64\}$  dan set  $B = \{-8, -6, 3, 4, 6, 7, 8\}$ .  
Hubungandarpada set  $A$  kepada set  $B$  ialah "kuasadua ", nyatakan*

- (a) the range of the relation,  
julat hubungan tersebut
- (b) the image of 49.  
imej kepada 49

[2 marks]  
[2 marks]

Answer / Jawapan :

- (a)
- (b)

1
2

2. Diagram 2 show the function  $g : x \mapsto \frac{4}{h-x}, x \neq h, h$  is a constant  
*Rajah 2 menunjukkan fungsi  $g : x \mapsto \frac{4}{h-x}, x \neq h$ , dengan keadaan  $h$  ialah pemalar.*

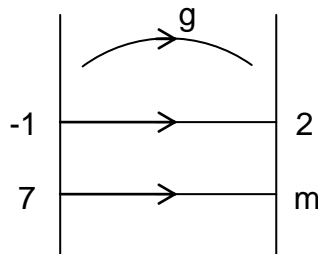


Diagram 2  
Rajah 2

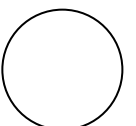
- (a) Find the value of  $h$   
*Carikan nilai  $h$ ,*
- (b) State the value of  $m$   
*Nyatakan nilai  $m$ .*

[3 marks]  
[3 markah]

Answer / Jawapan:

- (a)
- (b)

2
4



3. Given that  $f: x \mapsto 3 - 2x$  and  $g: x \mapsto x + k$ . If  $g^{-1}(2) = fg(3)$ , Find the value of  $k$ .  
*Diberi  $f: x \mapsto 3 - 2x$  dan  $g: x \mapsto x + k$ . Jika  $g^{-1}(2) = fg(3)$ , Carikan nilai  $k$ .*

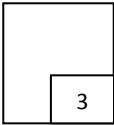
[3 marks]  
[3 markah]

Answer / Jawaban:

(a)

(b)

3



4. It is given that  $h$  and  $h+4$  are the roots of the quadratic equation  $x^2 - 2x + 3 - p = 0$  Find  
*Diberi bahawa  $h$  dan  $h+4$  adalah punca-punca persamaan kuadratik  $x^2 - 2x + 3 - p = 0$ . Cari*

(a) the value of  $h$   
nilai bagi  $h$

(b) the value of  $p$   
nilai bagi  $p$

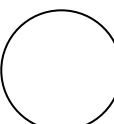
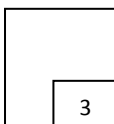
[3 marks]  
[3 markah]

Answer / Jawaban :

(a)

(b)

4



5. A quadratic equation  $2x(x-2p) = k-1$ , where  $h$  and  $p$  are constants, has two equal root. Express  $k$  in terms of  $p$ .  
*Persamaan kuadratik  $2x(x-2p) = k-1$ , dengan keadaan  $h$  dan  $p$  ialah pemalar mempunyai dua punca sama. Ungkapkan  $k$  dalam sebutan  $p$ .*

[3 marks]  
[3 markah]

Answer / Jawapan:

5

3

6. The quadratic function  $f(x) = a(x+p)^2 + q$ , where  $a, p$  and  $q$  are constant has a maximum value of 5. The equation of the axis of symmetry is  $x = 2$ .  
*Fungsi kuadratik  $f(x) = a(x+p)^2 + q$ , dengan keadaan  $a, p$  dan  $q$  ialah pemalar, mempunyai nilai maksimum 5. Persamaan paksi simetrinya ialah  $x = 2$ .*

State  
Nyatakan

- (a) the range of values of  $a$   
*julat nilai  $a$*
- (b) the value of  $p$   
*nilai  $p$*
- (c) the value of  $q$   
*nilai  $q$*

[3 marks]  
[3 markah]

Answer / Jawapan:

- (a)
- (b)
- (c)

6

3

[Lihat halaman sebelah  
SULIT

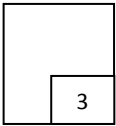
7. Solve the equation  $28 + 2^{x-2} = 2^{x+1}$

*Selesaikan persamaan*  $28 + 2^{x-2} = 2^{x+1}$

*Answer / Jawapan:*

[3 marks]  
[3 markah]

7



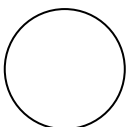
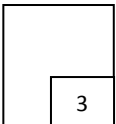
8. Solve the equation  $\log_2 3x - \log_2 (x+1) = 0$

*Selesaikan persamaan*  $\log_2 3x - \log_2 (x+1) = 0$

*Answer / Jawapan*

[3 marks]  
[3 markah]

8



9. Given that  $\log_2 h + \log_4 k = 2$ , express  $h$  in terms of  $k$ .  
*Diberi  $\log_2 h + \log_4 k = 2$ , ungkapkan  $h$  dalam  $k$ .*

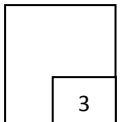
[4 marks]  
[4 markah]

Answer / Jawapan:

(a)

(b)

9



10. The first three terms of an arithmetic progression are  $2k - 3$ ,  $5$  and  $5k + 6$ .  
Find  
*Tiga sebutan pertama suatu jangjang aritmetik ialah  $2k - 3$ ,  $5$  dan  $5k + 6$ . Cari*

- (a) the value of  $k$ ,  
*nilai  $k$ ,*
- (b) the tenth term.  
*sebutan ke sepuluh.*

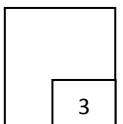
[4 marks]  
[4markah]

Answer / Jawapan:

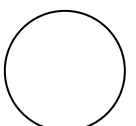
(a)

(b)

10



[Lihat halaman sebelah  
**SULIT**





11. The first four terms of a geometric progression are  $x, 1, 4, 16$ .  
*Empat sebutan pertama suatu janjang geometri ialah  $x, 1, 4, 16$*

Find

*Cari*

- (a) the value of  $x$   
*nilai  $x$*
- (b) the sum of the fifth term to the eighth term.  
*hasil tambah sebutan kelima hingga sebutan kelapan,*

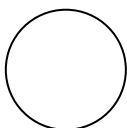
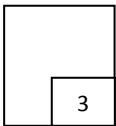
[4 marks]  
[4 markah]

Answer / *Jawapan:*

(a)

(b)

11



12. The variable  $x$  and  $y$  are related by the equation  $\frac{y}{2} = x + \frac{2k}{x}$   
Diagram 12 shows the straight line graph obtained by plotting  $xy$  against  $x^2$ .  
*Pembolehubah  $x$  dan  $y$  dihubungkan oleh persamaan  $\frac{y}{2} = x + \frac{2k}{x}$*   
*Rajah 12 menunjukkan graf garis lurus yang diperolehi dengan memplot  $xy$  melawan  $x^2$ .*

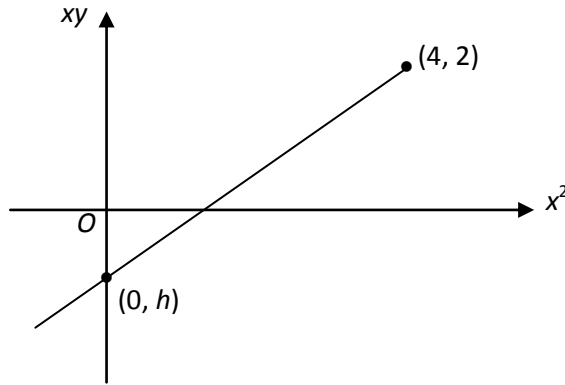


Diagram 12  
Rajah 12

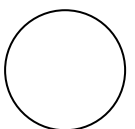
Find the value of  
Cari nilai

- (a)  $h$
- (b)  $k$

[3 marks]  
[3 markah]

Answer / Jawapan:

- (a)
- (b)

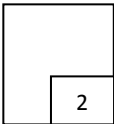


13. The points  $A(-3h, h)$ ,  $B(p, t)$  and  $C(2p, 3t)$  are on a straight line.  $B$  divides  $AC$  internally in the ratio  $2:3$ . Express  $p$  in terms of  $t$ .  
*Titik-titik  $A(-3h, h)$ ,  $B(p, t)$  dan  $C(2p, 3t)$  terletak pada satu garis lurus.  $B$  membahagi dalam  $AC$  dengan nisbah  $2:3$ . Ungkapkan  $p$  dalam sebutan  $t$ .*

[3 marks]  
[3 markah]

Answer / Jawapan:

13



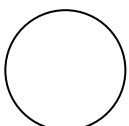
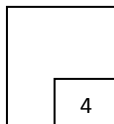
14. Solve the equation  $3\cos\theta + 4\sin\theta = 0$  for  $0^\circ \leq \theta \leq 360^\circ$

Selesaikan persamaan  $3\cos\theta + 4\sin\theta = 0$  bagi  $0^\circ \leq \theta \leq 360^\circ$

[3 marks]  
[3 markah]

Answer / Jawapan:

14



15. Diagram 15 shows two vector  $\vec{OA}$  and  $\vec{OB}$

Rajah 15 menunjukkan dua vektor  $\vec{OA}$  dan  $\vec{OB}$

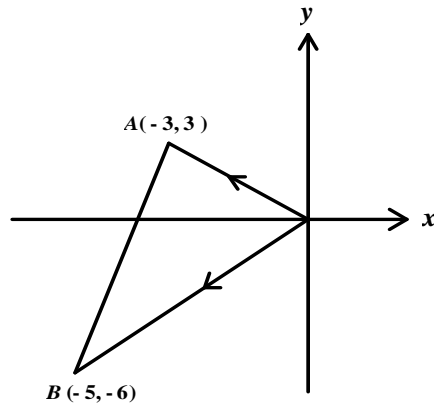


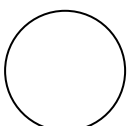
Diagram 15  
Rajah 15

Find  
Cari

- (a)  $\vec{AB}$  in the form  $xi + yj$   
 $\vec{AB}$  dalam bentuk  $xi + yj$
- (b) vector unit in direction  $\vec{AB}$   
vektor unit dalam arah  $\vec{AB}$

[4 marks]  
[4 markah]

Answer / Jawapan:



16. The point  $P$ ,  $Q$  and  $R$  are collinear. It is given that  $\overrightarrow{PQ} = a + 2b$  and  $\overrightarrow{QR} = 2a + (3-k)b$  where  $k$  is a constant.

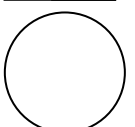
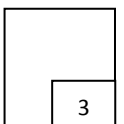
Titik  $P$ ,  $Q$  dan  $R$  adalah segaris. Diberi bahawa  $\overrightarrow{PQ} = a + 2b$  dan  $\overrightarrow{QR} = 2a + (3-k)b$  dengan keadaan  $k$  ialah pemalar.

Find  
Cari

- (a) the value of  $k$   
nilai  $k$
- (b) the ratio of  $PQ:QR$   
nisbah  $PQ:QR$

[4 marks]  
[4 markah]

Answer / Jawapan:



17. Diagram 17 shows a sector BOC of a circle with radius 9 cm. Given that the  $\angle COB = 1.92 \text{ rad}$  and  $OA = \frac{1}{3}OB$ .

Rajah 17 menunjukkan sektor BOC bagi sebuah bulatan dengan jejari 9 cm. Diberi bahawa  $\angle COB = 1.92 \text{ rad}$  dan  $OA = \frac{1}{3}OB$ .

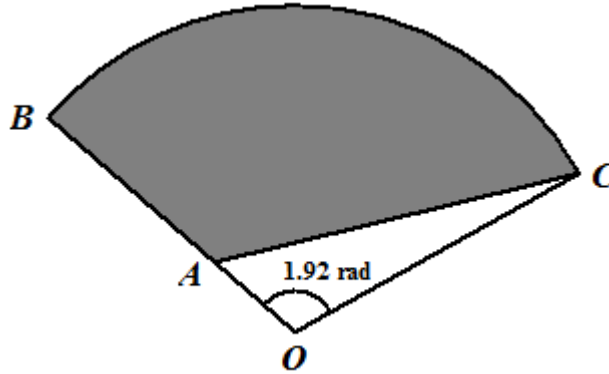
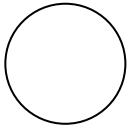


Diagram 17  
Rajah 17

Find the area, in  $\text{cm}^2$ , of the shaded region  
Cari luas, dalam  $\text{cm}^2$ , kawasan berlorek.

[3 marks]  
[3 markah]

Answer / Jawapan:



18. A set of six numbers has a mean of 8.  
Suatu set yang terdiri daripada enam nombor mempunyai min 8.

(a) Find  $\sum x$   
Cari  $\sum x$

(b) When two numbers  $k$  and  $2k$  is added to this set, the new mean is 9.  
Find the value of  $k$ .  
Apabila dua nombor  $k$  dan  $2k$  ditambah kepada set ini, min baru ialah 9. Cari nilai  $k$ .

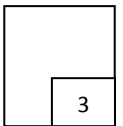
[3 marks]  
[3 markah]

Answer / Jawapan:

(a)

(b)

18



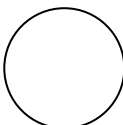
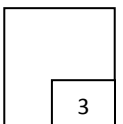
19. Given  $y = \frac{8}{x^2}$ , find in terms of  $p$ , approximate change in  $y$  when  $x$  decrease from 4 to  $4 - p$ .

Diberi  $y = \frac{8}{x^2}$ , cari dalam sebutan  $p$ , kadar perubahan dalam  $y$  apabila  $x$  menyusut 4 to  $4 - p$ .

[3 marks]  
[3 markah]

Answer / Jawapan:

19

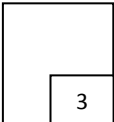


20. The curve  $y = -(x+2)(x-10)$  has a maximum point at  $x = p$  where  $p$  is a constant. Find the value of  $p$   
*Lengkung  $y = -(x+2)(x-10)$  mempunyai titik maksimum di  $x = p$ , dengan  $p$  ialah pemalar. Cari nilai  $p$ .*

[2 marks]  
[2 markah]

Answer / Jawapan:

19



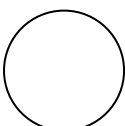
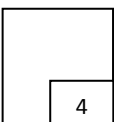
21. Find the value of  $t$  if  $\int_1^t \frac{2x(x-1)}{x} dx = 4$

Cari nilai  $t$  jika  $\int_1^t \frac{2x(x-1)}{x} dx = 4$

[4 marks]  
[4 markah]

Answer / Jawapan:

21





22. Given that  $\frac{d}{dx} \left[ \frac{x^2}{x-1} \right] = g(x)$ , calculate the value of  $\int_2^3 2 g(x) dx$ .

Diberi  $\frac{d}{dx} \left[ \frac{x^2}{x-1} \right] = g(x)$ , kirakan nilai bagi  $\int_2^3 2 g(x) dx$ .

[2 marks]  
[2 markah]

Answer / Jawapan:

22

4

23. Diagram 23 shows six letter cards.  
Rajah 23 menunjukkan enam keeping kad huruf.

**B R A S I L**

A four-letter code is to be formed using four of these cards.

*Suatu kod lima huruf hendak dibentuk dengan menggunakan empat daripada kad-kad itu.*

Find  
*Cari*

- (a) the number of different four-letter codes that can be formed.  
*bilangan kad empat huruf yang berlainan yang dapat dibentuk.*
- (b) the number of different four-letter codes which begin with a vowel and end with a consonant.  
*bilangan kad empat huruf yang berlainan yang bermula dengan huruf vokal dan berakhir dengan huruf konsonan.*

[3 marks]  
[3 markah]

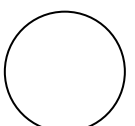
Answer / Jawapan:

(a)

(b)

23

4



24. At the place where Rizal stays, rain falls in any two days of a week. Out of 75% of the raining days, Rizal goes to school by his father's car. If there is no rain, Rizal cycles to the school. For every 5 days Rizal goes to school by his father's car, for 3 days Rizal is able to keep his pocket money. In a certain day, find the probability that

*Di tempat tinggal Rizal, hujan turun dalam mana-mana dua hari dalam seminggu. Sebanyak 75% hari yang hujan, Rizal pergi ke sekolah dengan menaiki kereta ayahnya. Jika hari tidak hujan, Rizal ke sekolah dengan basikalnya. Selama 5 hari Rizal pergi ke sekolah dengan menaiki kereta ayahnya, selama 3 hari Rizal dapat menyimpan duit poketnya. Dalam hari tertentu, cari kebarangkalian*

- (a) Rizal does not goes to school in his father's car,  
*Rizal tidak menaiki kereta ayahnya untuk ke sekolah*
- (b) Rizal keeps his pocket money because he goes to school in his father's car  
*Rizal menyimpan duit poketnya kerana dia ke sekolah dengan menaiki kereta ayahnya*

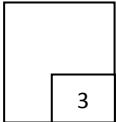
[4 marks]  
[4 markah]

Answer / Jawapan:

(a)

(b)

24

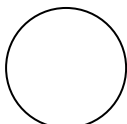
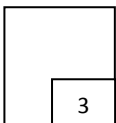


25. Given that  $Z$  is a standardised normal random variable, find the value of  $k$  if  
*Diberi bahawa  $Z$  ialah pembolehubah rawak piawai bagi taburan normal, cari nilai  $k$  jika*

- (a)  $P(Z > k) = 0.1762$
- (b)  $P(|Z| > k) = 0.1336$

[4 marks]qqqqqqqqqq

25



**END OF QUESTIONS  
SOALAN TAMAT**

[Lihat halaman sebelah  
SULIT