

NO. KAD PENGENALAN

ANGKA GILIRAN

Nama ..... Tingkatan .....

Sekolah .....

**MODUL PINTAS  
TINGKATAN 5**

**3472/1**

**ADDITIONAL MATHEMATICS  
Kertas 1**

2 jam

**Dua jam**

**JANGAN BUKA KERTAS PEPERIKSAAN INI  
SEHINGGA DIBERITAHU**

1. *Tulis nombor kad pengenalan, angka giliran, nama, tingkatan dan sekolah anda pada petak yang disediakan.*
2. *Kertas peperiksaan ini adalah dalam dwibahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Melayu.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Melayu.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas peperiksaan ini.*

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

Kertas peperiksaan ini mengandungi 32 halaman bercetak.

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[ Lihat halaman sebelah

3  
4  
7  
2  
1

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### CALCULUS KALKULUS

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

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

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

$$4 \quad \text{Area under a curve} \\ \text{Luas di bawah lengkung} \\ = \int_a^b y \, dx \text{ or (atau)} \\ = \int_a^b x \, dy$$

$$5 \quad \text{Volume of revolution} \\ \text{Isi padu kisanan} \\ = \int_a^b \pi y^2 \, dx \text{ or (atau)} \\ = \int_a^b \pi x^2 \, dy$$

**STATISTICS**  
**STATISTIK**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**GEOMETRY**  
**GEOMETRI**

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

$$2 \quad \text{Midpoint / Titik tengah} \\ (x, y) = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$3 \quad \text{A point dividing a segment of a line} \\ \text{Titik yang membahagi suatu tembereng garis} \\ (x, y) = \left( \frac{nx_1 + mx_2}{m+n}, \frac{ny_1 + my_2}{m+n} \right)$$

$$4 \quad \text{Area of triangle / Luas segi tiga} \\ = \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

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

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

**TRIGONOMETRY**  
**TRIGONOMETRI**

1 Arc length,  $s = r \theta$   
*Panjang lengkok,  $s = j \theta$*

2 Area of sector,  $A = \frac{1}{2} r^2 \theta$   
*Luas sektor,  $L = \frac{1}{2} j^2 \theta$*

3  $\sin^2 A + \cos^2 A = 1$   
 $\sin^2 A + \text{kos}^2 A = 1$

4  $\sec^2 A = 1 + \tan^2 A$   
 $\text{sek}^2 A = 1 + \tan^2 A$

5  $\text{cosec}^2 A = 1 + \cot^2 A$   
 $\text{kosek}^2 A = 1 + \text{kot}^2 A$

6  $\sin 2A = 2 \sin A \cos A$   
 $\sin 2A = 2 \sin A \text{kos} A$

7  $\cos 2A = \cos^2 A - \sin^2 A$   
 $= 2 \cos^2 A - 1$   
 $= 1 - 2 \sin^2 A$

$\text{kos} 2A = \text{kos}^2 A - \sin^2 A$   
 $= 2 \text{kos}^2 A - 1$   
 $= 1 - 2 \sin^2 A$

8  $\sin (A \pm B) = \sin A \cos B \pm \cos A \sin B$   
 $\sin (A \pm B) = \sin A \text{kos} B \pm \text{kos} A \sin B$

9  $\cos (A \pm B) = \cos A \cos B \mp \sin A \sin B$   
 $\text{kos} (A \pm B) = \text{kos} A \text{kos} B \mp \sin A \sin B$

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  $a^2 = b^2 + c^2 - 2bc \cos A$   
 $a^2 = b^2 + c^2 - 2bc \text{kos} A$

14 Area of triangle / *Luas segi tiga*  
 $= \frac{1}{2} ab \sin C$

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

- 1 Diagram 1 shows the relation between set  $X$  and set  $Y$  in the graph form.  
Rajah 1 menunjukkan hubungan antara set  $X$  dan set  $Y$  dalam bentuk graf.

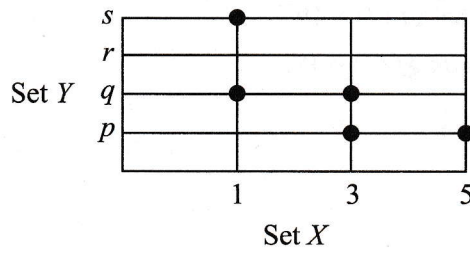


Diagram 1  
Rajah 1

State  
Nyatakan

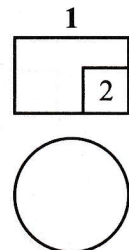
- (a) the objects of  $q$ ,  
objek-objek bagi  $q$ ,
- (b) the codomain of the relation.  
kodomain hubungan itu.

[2 marks]  
[2 markah]

Answer / Jawapan:

(a)

(b)



For  
Examiner's  
Use

2 Given the functions  $f(x) = x + 3$  and  $g(x) = kx - 1$ , find  
Diberi fungsi  $f(x) = x + 3$  dan  $g(x) = kx - 1$ , cari

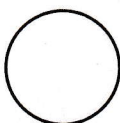
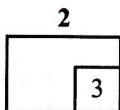
- (a)  $f(7)$ ,
- (b) the value of  $k$  such that  $gf(7) = 19$ .  
nilai  $k$  dengan keadaan  $gf(7) = 19$ .

[3 marks]  
[3 markah]

Answer / Jawapan:

(a)

(b)



- 3 It is given that  $\alpha$  and  $\beta$  are the roots of the quadratic equation  $(2x - 3)(x + 4) + p = 0$  and  $\alpha = 4\beta$ , where  $p$  is constant.

Find the value of  $p$ .

[4 marks]

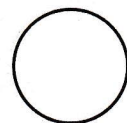
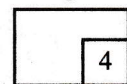
*Diberi bahawa  $\alpha$  dan  $\beta$  adalah punca-punca bagi persamaan kuadratik  $(2x - 3)(x + 4) + p = 0$  dan  $\alpha = 4\beta$ , dengan keadaan  $p$  ialah pemalar.*

*Cari nilai bagi  $p$ .*

[4 markah]

Answer / Jawapan:

3



- 4 Diagram 4 shows the shaded region that satisfied a quadratic inequality.  
*Rajah 4 menunjukkan kawasan berlorek yang memuaskan suatu ketaksamaan kuadratik.*

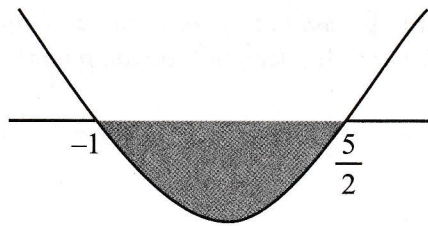


Diagram 4  
*Rajah 4*

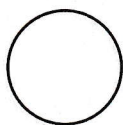
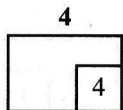
Form the quadratic inequality.

[4 marks]

*Bentukkan ketaksamaan kuadratik tersebut.*

[4 markah]

Answer / *Jawapan:*





- 5 Diagram 5 shows the graph of the quadratic function  $f(x) = (x-3)^2 + 2p - 1$ , where  $p$  is a constant.

Rajah 5 menunjukkan graf fungsi kuadratik  $f(x) = (x-3)^2 + 2p - 1$ , dengan keadaan  $p$  ialah pemalar.

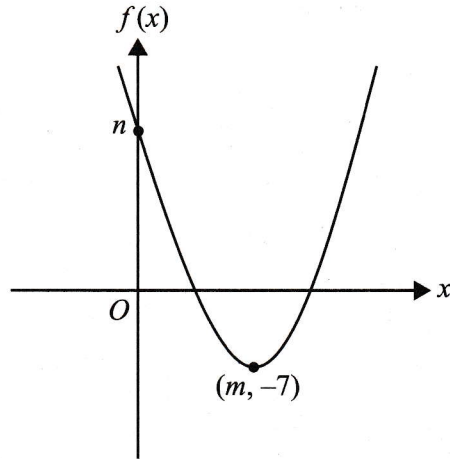


Diagram 5  
Rajah 5

Find  
Cari

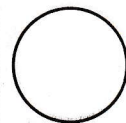
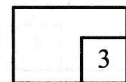
- (a) the value of  $m$  and of  $p$ ,  
nilai  $m$  dan nilai  $p$ ,
- (b) the value of  $n$ .  
nilai  $n$ .

[3 marks]  
[3 markah]

Answer / Jawapan:

- (a)
- (b)

5

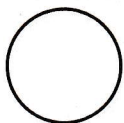
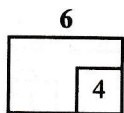


- 6 Solve the equation:  
*Selesaikan persamaan:*

$$\sqrt{27^{3-x}} = \frac{1}{9^x}$$

[4 marks]  
[4 markah]

Answer / *Jawapan:*



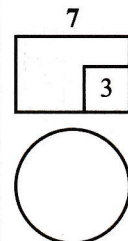
7 Given that  $\log_9 x = \log_3 2$ , find the value of  $x$ .

[3 marks]

*Diberi  $\log_9 x = \log_3 2$ , cari nilai  $x$ .*

[3 markah]

Answer / Jawapan:



- 8 Diagram 8 shows a straight line  $y = (b + 3)x + 8$  which is parallel to  $y = 5 - (3b - 4)x$ .  
*Rajah 8 menunjukkan suatu garis lurus  $y = (b + 3)x + 8$  yang selari dengan  $y = 5 - (3b - 4)x$ .*

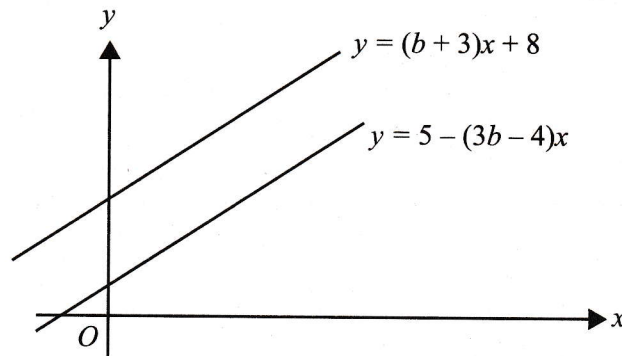
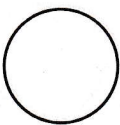
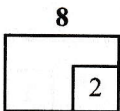


Diagram 8  
*Rajah 8*

Find the value of  $b$ .  
*Cari nilai  $b$ .*

[2 marks]  
[2 markah]

Answer / *Jawapan:*



- 9 Diagram 9 shows the graph of  $2y = 3x - 12$ . Point  $R(x, y)$  moves such that it is equidistance from the points  $P$  and  $Q$ .

Rajah 9 menunjukkan graf bagi  $2y = 3x - 12$ . Titik  $R(x, y)$  bergerak dengan keadaan jaraknya dari titik  $P$  dan  $Q$  adalah sama.

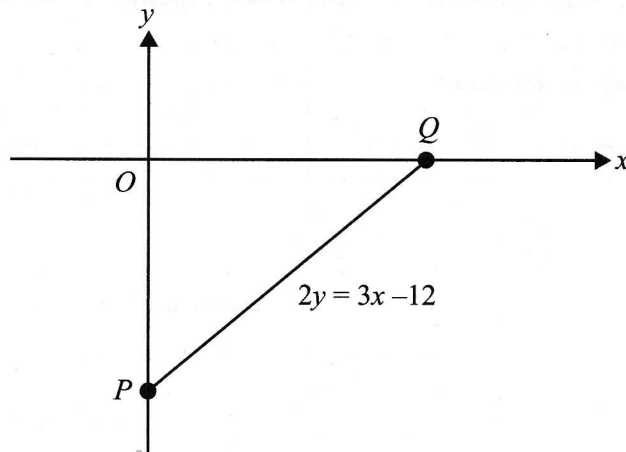


Diagram 9  
Rajah 9

Find the equation of the locus of  $R$ .

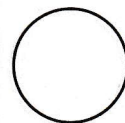
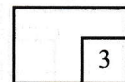
[3 marks]

Cari persamaan lokus bagi  $R$ .

[3 markah]

Answer / Jawapan:

9



- 10 A set of data,  $X$  consist of five positive numbers. It is given that  $\bar{x} = \sqrt{h}$ ,  $\sum x^2 = 125$  and  $\sigma = 2k$ .

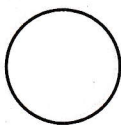
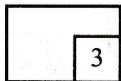
Express  $h$  in terms of  $k$ . [3 marks]

*Satu set data,  $X$  terdiri daripada lima nombor positif. Diberi bahawa  $\bar{x} = \sqrt{h}$ ,  $\sum x^2 = 125$  dan  $\sigma = 2k$ .*

*Ungkapkan  $h$  dalam sebutan  $k$ .* [3 markah]

Answer / Jawapan:

10



- 11 Table 11 shows a distribution of scores obtained by a group of participants in a quiz.

*Jadual 11 menunjukkan satu taburan skor yang diperolehi sekumpulan peserta dalam suatu kuiz.*

Score Skor	1 – 3	4 – 6	7 – 9	10 – 12	13 – 15
Cumulative frequency <i>Kekerapan longgokan</i>	3	10	25	35	40

Table 11  
*Jadual 11*

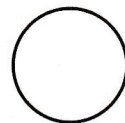
- (a) State the number of participants.  
*Nyatakan jumlah peserta.*
- (b) Find the mean score.  
*Cari skor min.*

[3 marks]  
[3 markah]

Answer / *Jawapan:*

(a)

(b)



12 Diagram 12 shows a sector  $OPQ$  of a circle with centre  $O$ .

Rajah 12 menunjukkan sektor  $OPQ$  bagi sebuah bulatan dengan pusat  $O$ .

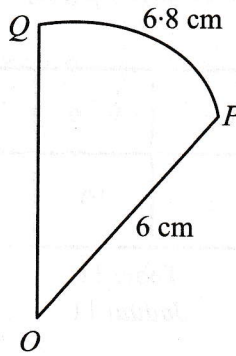


Diagram 12  
Rajah 12

[Use / Guna,  $\pi = 3.142$ ]

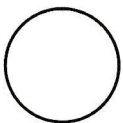
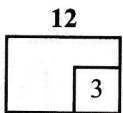
Find the area of the sector  $OPQ$ .

[3 marks]

Cari luas sektor  $OPQ$ .

[3 markah]

Answer / Jawapan:





- 13 The gradient function of a curve is  $\frac{dy}{dx} = px - 6$ , where  $p$  is a constant. It is given that the curve has a turning point at (3, 1).

*Fungsi kecerunan suatu lengkung ialah  $\frac{dy}{dx} = px - 6$ , dengan keadaan  $p$  ialah pemalar. Diberi bahawa lengkung itu mempunyai titik pusingan pada (3, 1).*

Find

*Cari*

- (a) the value of  $p$ ,  
*nilai  $p$ ,*
- (b) the equation of the curve.  
*persamaan lengkung itu.*

[4 marks]

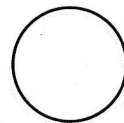
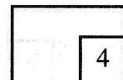
[4 markah]

Answer / *Jawapan:*

(a)

(b)

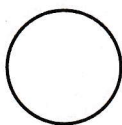
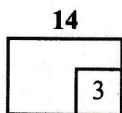
13



- 14 It is given that the first term and last term of an arithmetic progression is 9 and 165. If the sum of the term is 3 480, find the number of terms and the common difference of the series. [3 marks]

*Diberi bahawa sebutan pertama dan sebutan terakhir bagi suatu jangjang aritmetik ialah 9 dan 165. Jika hasil tambah sebutan ialah 3 480, cari bilangan sebutan dan beza sepunya bagi turutan tersebut.* [3 markah]

Answer / Jawapan:



15 Three consecutive terms of an arithmetic progression are  $5 - y$ ,  $8$ ,  $-10y$ .

Find the common difference of the progression.

[3 marks]

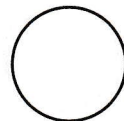
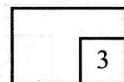
*Tiga sebutan berturut-turut bagi suatu jangjang aritmetik ialah  $5 - y$ ,  $8$ ,  $-10y$ .*

*Cari beza sepunya jangjang itu.*

[3 markah]

Answer / Jawapan:

15



For  
Examiner's  
Use

20

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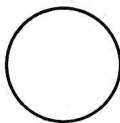
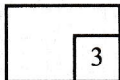
- 16 Given  $0.0363636\dots$  is a recurring decimal number.  
Express the number as a fraction in its simplest form. [3 marks]

*Diberi  $0.0363636\dots$  ialah suatu nombor perpuluhan yang berulang.*

*Ungkapkan nombor itu sebagai pecahan dalam bentuk teringkas.* [3 markah]

Answer / Jawapan:

16



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- 17 Diagram 17 shows a part of a graph  $\log_{10}y$  against  $\log_{10}x$ . The variables,  $x$  and  $y$  are related by the equation  $y = bx^n$ , where  $b$  and  $n$  are constants.

Rajah 17 menunjukkan sebahagian graf  $\log_{10}y$  melawan  $\log_{10}x$ . Pemboleh ubah  $x$  dan  $y$  dihubungkan oleh persamaan  $y = bx^n$ , dengan keadaan  $b$  dan  $n$  adalah pemalar.

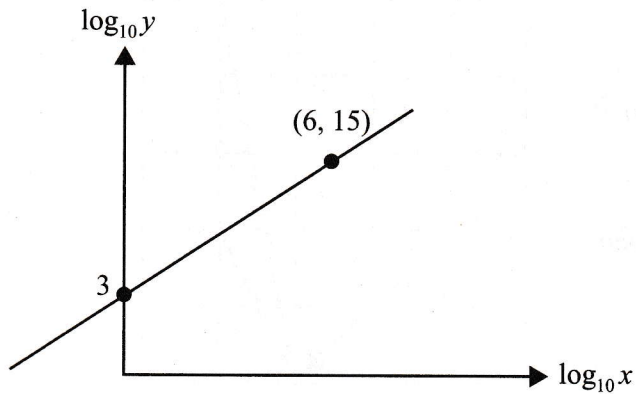


Diagram 17  
Rajah 17

Find the values of  $b$  and  $n$ .

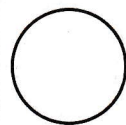
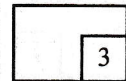
[3 marks]

Cari nilai  $b$  dan  $n$ .

[3 markah]

Answer / Jawapan:

17



18 Given  $\int_5^8 h(x) dx = 3$ , find

Diberi  $\int_5^8 h(x) dx = 3$ , cari

(a)  $\int_8^5 h(x) dx$ ,

(b)  $\int_5^8 [7 - h(x)] dx$ .

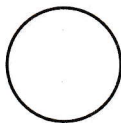
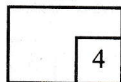
[4 marks]  
[4 markah]

Answer / Jawapan:

(a)

(b)

18



3472/1

- 19 Diagram 19 shows the vectors  $\vec{OA}$ ,  $\vec{OB}$  and  $\vec{OP}$  drawn on a grid of equal squares with sides of 1 unit.

Rajah 19 menunjukkan vektor  $\vec{OA}$ ,  $\vec{OB}$  dan  $\vec{OP}$  dilukis pada grid segi empat sama yang sama besar bersisi 1 unit.

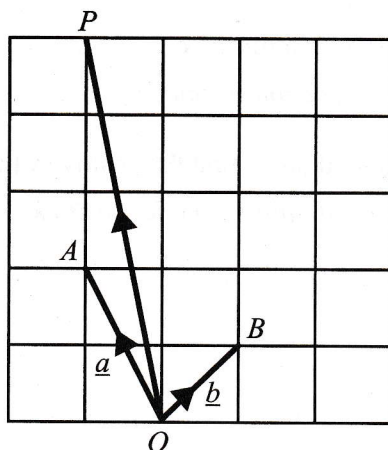


Diagram 19  
Rajah 19

Determine

Tentukan

- (a)  $|\vec{OP}|$ ,
- (b)  $\vec{OP}$  in terms of  $\underline{a}$  and  $\underline{b}$ .  
 $\vec{OP}$  dalam sebutan  $\underline{a}$  dan  $\underline{b}$ .

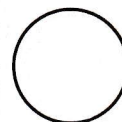
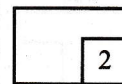
[2 marks]  
[2 markah]

Answer / Jawapan:

(a)

(b)

19



20 It is given that vector  $\underline{r} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$  and vector  $\underline{s} = \begin{pmatrix} k \\ -9 \end{pmatrix}$ , where  $k$  is constant.

Diberi bahawa vektor  $\underline{r} = \begin{pmatrix} 4 \\ 6 \end{pmatrix}$  dan vektor  $\underline{s} = \begin{pmatrix} k \\ -9 \end{pmatrix}$ , dengan keadaan  $k$  ialah pemalar.

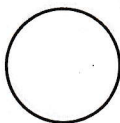
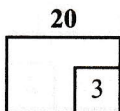
- (a) Express the vector  $\underline{r} + \underline{s}$ , in terms of  $k$ ,  
Ungkapkan vektor  $\underline{r} + \underline{s}$ , dalam sebutan  $k$ ,
- (b) It is given that  $|\underline{r} + \underline{s}| = 10$  units, find the positive value of  $k$ .  
Diberi bahawa  $|\underline{r} + \underline{s}| = 10$  unit, cari nilai positif  $k$ .

[3 marks]  
[3 markah]

Answer / Jawapan:

(a)

(b)





21 Solve the equation  $\sec^2 \theta = 3 - \tan \theta$  for  $0^\circ \leq \theta \leq 360^\circ$ .

[4 marks]

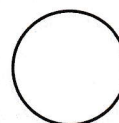
*Selesaikan persamaan  $\sec^2 \theta = 3 - \tan \theta$  untuk  $0^\circ \leq \theta \leq 360^\circ$ .*

[4 markah]

Answer / Jawapan:

21

	4



- 22 Diagram 22 shows a eight-letter word.  
*Rajah 22 menunjukkan satu perkataan lapan huruf.*

**M A T R I C E S**

Diagram 22

*Rajah 22*

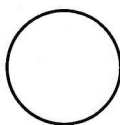
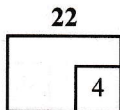
- (a) Find the number of different ways to arrange all the letters in a row.  
*Cari bilangan cara yang berlainan untuk menyusun semua huruf dalam satu baris.*
- (b) Four letters are to be chosen from the word.  
Find the number of ways of choosing the four letters which consists of 3 consonants.  
*Empat huruf akan dipilih daripada perkataan itu.  
Cari bilangan cara untuk memilih empat huruf itu yang terdiri daripada 3 konsonan.*

[4 marks]  
[4 markah]

Answer / *Jawapan:*

(a)

(b)



- 23 The Science society of a school has 8 male members and 12 female members. Two members are to be chosen at random.

*Persatuan Sains bagi sebuah sekolah mempunyai 8 ahli lelaki dan 12 ahli perempuan. Dua orang ahli dipilih secara rawak.*

Find the probability that

*Cari kebarangkalian bahawa*

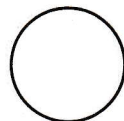
- (a) both members are male,  
*kedua-dua ahli adalah lelaki,*
- (b) they are different genders.  
*mereka adalah berlainan jantina.*

[3 marks]  
[3 markah]

Answer / *Jawapan:*

(a)

(b)

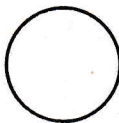


- 24 An unbiased coin is tossed for 200 times. If the outcome of getting head is defined as success, find the variance and standard deviation of the experiment. [3 marks]
- Satu syiling yang adil dilambung sebanyak 200 kali. Jika hasil lambungan mendapat kepala dianggap sebagai berjaya, cari varians dan sisihan piawai bagi eksperimen itu. [3 markah]*

Answer / Jawapan:

24

3



3472/1

- 25  $X$  is a random variable of a normal distribution with a mean of 4.2 and a variance of 1.69.

*X ialah pemboleh ubah rawak bagi suatu taburan normal dengan min 4.2 dan varians 1.69.*

Find  
Cari

- (a) the z-score if  $x = 5.7$ ,  
*skor-z jika  $x = 5.7$ ,*
- (b)  $P(4.2 < x < 5.7)$ .

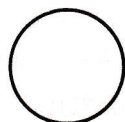
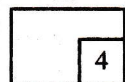
[4 marks]  
[4 markah]

Answer / Jawapan:

(a)

(b)

END OF QUESTION PAPER  
KERTAS PEPERIKSAAN TAMAT



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**HALAMAN KOSONG**

**THE UPPER TAIL PROBABILITY  $Q(z)$  FOR THE NORMAL DISTRIBUTION  $N(0,1)$   
KEBARANGKALIAN Hujung Atas  $Q(z)$  BAGI TABURAN NORMAL  $N(0, 1)$**

z										Minus / Tolak									
	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859	4	8	12	15	19	23	27	31	35
0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483	4	7	11	15	19	22	26	30	34
0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121	4	7	11	15	18	22	25	29	32
0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776	3	7	10	14	17	20	24	27	31
0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451	3	7	10	13	16	19	23	26	29
0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148	3	6	9	12	15	18	21	24	27
0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867	3	5	8	11	14	16	19	22	25
0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611	3	5	8	10	13	15	18	20	23
1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379	2	5	7	9	12	14	16	19	21
1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170	2	4	6	8	10	12	14	16	18
1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985	2	4	6	7	9	11	13	15	17
1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823	2	3	5	6	8	10	11	13	14
1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	1	3	4	6	7	8	10	11	13
1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	1	2	4	5	6	7	8	10	11
1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455	1	2	3	4	5	6	7	8	9
1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	1	2	3	4	4	5	6	7	8
1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	1	1	2	3	4	4	5	6	6
1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	1	1	2	2	3	4	4	5	5
2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	0	1	1	2	2	3	3	4	4
2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	0	1	1	2	2	2	3	3	4
2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	0	1	1	1	2	2	2	3	3
2.3	0.0107	0.0104	0.0102								0	1	1	1	1	2	2	2	2
			0.00990		0.00964	0.00939	0.00914				3	5	8	10	13	15	18	20	23
2.4	0.00820	0.00798	0.00776	0.00755	0.00734			0.00889	0.00866	0.00842	2	5	7	9	12	14	16	16	21
						0.00714	0.00695	0.00676	0.00657	0.00639	2	4	6	7	9	11	13	15	17
2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480	2	3	5	6	8	9	11	12	14
2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.00368	0.00357	1	2	3	5	6	7	9	9	10
2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264	1	2	3	4	5	6	7	8	9
2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193	1	1	2	3	4	4	5	6	6
2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139	0	1	1	2	2	3	3	4	4
3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100	0	1	1	2	2	2	3	3	4

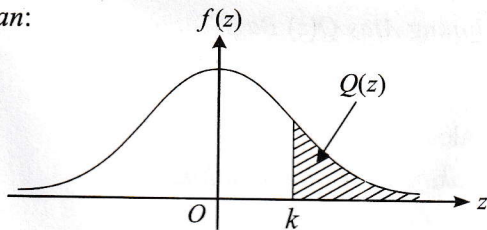
For negative z use relation:

Bagi z negatif guna hubungan:

$$Q(z) = 1 - Q(-z) = P(-z)$$

$$f(z) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{1}{2}z^2\right)$$

$$Q(z) = \int_k^{\infty} f(z) dz$$



Example / Contoh:

If  $X \sim N(0, 1)$ , then

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

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

$$P(X > 2.1) = Q(2.1) = 0.0179$$

**INFORMATION FOR CANDIDATES**  
**MAKLUMAT UNTUK CALON**

1. This question paper consists of **25** questions.  
*Kertas soalan ini mengandungi 25 soalan.*
2. Answer **all** questions.  
*Jawab semua soalan.*
3. Write your answers in the spaces provided in the question paper.  
*Tulis jawapan anda dalam ruang yang disediakan dalam kertas peperiksaan.*
4. Show your working. It may help you to get marks.  
*Tunjukkan langkah-langkah penting dalam kerja mengira anda. Ini boleh membantu anda untuk mendapatkan markah.*
5. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.  
*Sekiranya anda hendak menukar jawapan, batalkan jawapan yang telah dibuat. Kemudian tulis jawapan yang baharu.*
6. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
7. The marks allocated for each question are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.*
8. A list of formulae is provided on page **2** to **4**.  
*Satu senarai rumus disediakan di halaman 2 hingga 4.*
9. The Upper Tail Probability  $Q(z)$  For The Normal Distribution  $N(0, 1)$  Table is provided on page **31**.  
*Jadual Kebarangkalian Hujung Atas  $Q(z)$  Bagi Taburan Normal  $N(0, 1)$  disediakan di halaman 31.*
10. You may use a scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik.*
11. Hand in this question paper to the invigilator at the end of the examination.  
*Serahkan kertas peperiksaan ini kepada pengawas peperiksaan di akhir peperiksaan.*