

NAMA	
ANGKA GILIRAN	

**PEPERIKSAAN PERCUBAAN SPM TAHUN 2009**  
**ADDITIONAL MATHEMATICS**

3472/1

Kertas 1

September 2009

2 jam

Dua jam

**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

- Kertas soalan ini adalah dalam dwibahasa.*
- Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Malaysia.*
- Calon dibenarkan menjawab keseluruhan atau sebahagian soalan dalam bahasa Inggeris atau bahasa Malaysia.*
- Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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

Kertas soalan ini mengandungi 20 halaman bercetak.

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

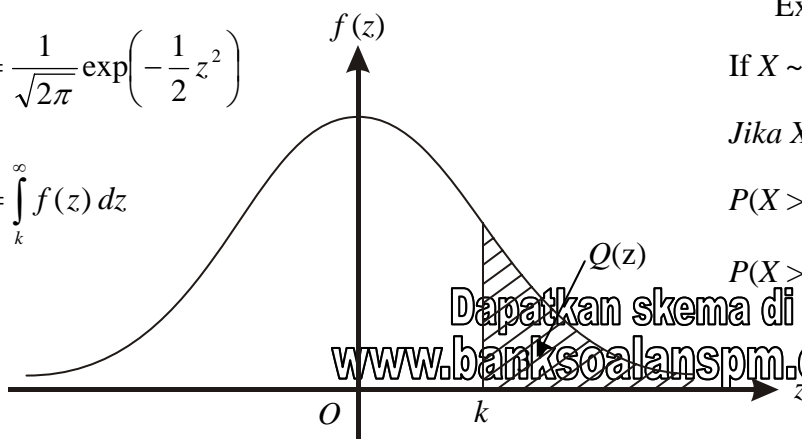
1. This question paper consists of **25** questions.  
*Kertas soalan ini mengandungi **25** soalan.*
2. Answer **all** questions.  
*Jawab **semua** soalan.*
3. Give only **one** answer for each question.  
*Bagi setiap soalan beri **satu** jawapan sahaja.*
4. Write your answers in the spaces provided in this question paper.  
*Jawapan anda hendaklah ditulis pada ruang yang disediakan dalam kertas soalan ini.*
5. 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.*
6. If you wish to change your answer, cross out the answer that you have done. Then write down the new answer.  
*Jika anda hendak menukar jawapan, batalkan dengan kemas jawapan yang telah dibuat. Kemudian tulis jawapan yang baru.*
7. The diagrams in the questions provided are not drawn to scale unless stated.  
*Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.*
8. The marks allocated for each question are shown in brackets.  
*Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.*
9. A list of formulae is provided on pages 3 to 5.  
*Satu senarai rumus disediakan di halaman 3 hingga 5.*
10. A four-figure table for the Normal Distribution  $N(0, 1)$  is provided on page 2.  
*Satu jadual empat angka bagi Taburan Normal  $N(0, 1)$  disediakan di halaman 2.*
11. You may use a non-programmable scientific calculator.  
*Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.*
12. Hand in this question paper to the invigilator at the end of the examination.  
*Serahkan kertas soalan ini kepada pengawas peperiksaan pada akhir peperiksaan.*

**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
								0.00889	0.00866	0.00842	2	5	7	9	12	14	16	16	21
2.4	0.00820	0.00798	0.00776	0.00755	0.00734						2	4	6	8	11	13	15	17	19
						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

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

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



Example / Contoh:

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

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

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

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

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SULIT

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The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used. 2

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

$$y = \frac{u}{v}, \frac{dy}{dx}$$

3

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

5

Volume  
generate  
d

## 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 / KALKULUS

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

4 Area under a curve

**STATISTICS / STATISTIK**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**GEOMETRY / GEOMETRI**

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

$$2 \quad \text{Midpoint / Titik tengah}$$

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

$$3 \quad \text{A point dividing a segment of a line} \\ \text{Titik yang membahagi suatu tembereng garis}$$

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

$$4 \quad \text{Area of triangle / Luas segitiga}$$

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

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

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

## TRIGONOMETRY / TRIGONOMETRI

- |   |  |    |  |
|---|--|----|--|
| 1 | Arc length, $s = r\theta$<br>Panjang lengkok, $s = j\theta$  | 8  | $\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$<br>$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$ |
| 2 | Area of sector, $A = \frac{1}{2}r^2\theta$<br>Luas sector, $L = \frac{1}{2}j^2\theta$  | 9  | $\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$<br>$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$ |
| 3 | $\sin^2 A + \cos^2 A = 1$<br>$\sin^2 A + \cos^2 A = 1$   | 10 | $\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$  |
| 4 | $\sec^2 A = 1 + \tan^2 A$<br>$\sec^2 A = 1 + \tan^2 A$   | 11 | $\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$  |
| 5 | $\operatorname{cosec}^2 A = 1 + \cot^2 A$<br>$\operatorname{kosec}^2 A = 1 + \cot^2 A$   | 12 | $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$   |
| 6 | $\sin 2A = 2 \sin A \cos A$<br>$\sin 2A = 2 \sin A \cos A$   | 13 | $a^2 = b^2 + c^2 - 2bc \cos A$<br>$a^2 = b^2 + c^2 - 2bc \cos A$                                       |
| 7 | $\cos 2A = \cos^2 A - \sin^2 A$<br>$= 2 \cos^2 A - 1$<br>$= 1 - 2 \sin^2 A$<br><br>$\cos 2A = \cos^2 A - \sin^2 A$<br>$= 2 \cos^2 A - 1$<br>$= 1 - 2 \sin^2 A$ | 14 | Area of triangle / Luas segitiga<br>$= \frac{1}{2} ab \sin c$  |

For  
Examiner's  
Use

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

- 1 Diagram 1 shows the relation between set  $P$  and set  $Q$ .  
Rajah 1 menunjukkan hubungan antara set  $P$  dan set  $Q$ .

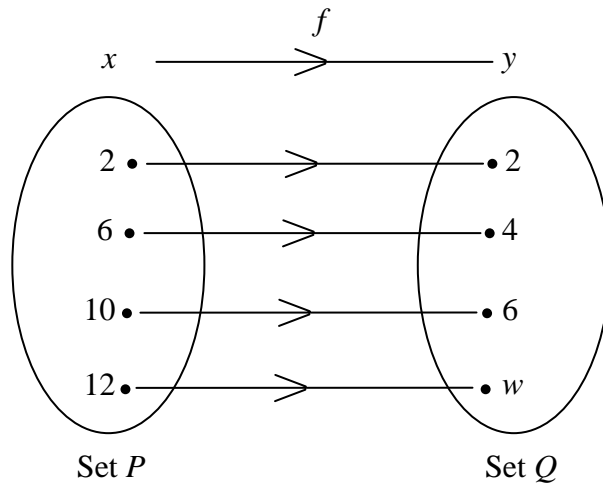


Diagram 1  
Rajah 1

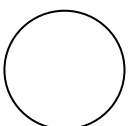
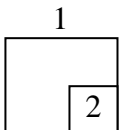
State  
Nyatakan

- (a) the type of relation between set  $P$  and set  $Q$ .  
jenis hubungan antara set  $P$  dan set  $Q$ .
- (b) the value of  $w$  if  $f : x \rightarrow \frac{x}{2} + 1$ .  
nilai bagi  $w$  jika  $f : x \rightarrow \frac{x}{2} + 1$ .

[ 2 marks]  
[2 markah]

Answer / Jawapan: (a) .....

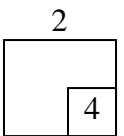
(b)  $w =$ .....



2 Given the function  $g : x \rightarrow 3(x - 1)$ , find  
Diberi fungsi  $g : x \rightarrow 3(x - 1)$ , cari

- |   |                          |            |
|---|--------------------------|------------|
| (a) the value of $g^2(4)$ ,<br>nilai bagi $g^2(4)$ ,                        | [2 marks]<br>[2 markah]  | [2 markah] |
| (b) the function of $f$ if $gf(x) = 6x$ .<br>fungsi $f$ jika $gf(x) = 6x$ . | [ 2 marks]<br>[2 markah] | [2 markah] |

Answer / Jawapan: (a) .....  
(b) .....

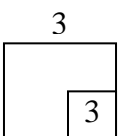


3 The quadratic equation  $x^2 - (3 - p)x + p - 3 = 0$ , where  $p$  is constant, has two equal roots. Find the possible values of  $p$ . [3 marks]

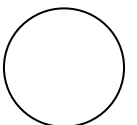
*Persamaan kuadratik  $x^2 - (3 - p)x + p - 3 = 0$ , dengan keadaan  $p$  ialah pemalar, mempunyai dua punca sama. Cari nilai-nilai  $p$  yang mungkin.*

[3 marks]  
[3 markah]

Answer / Jawapan:  $p =$  .....

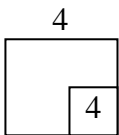


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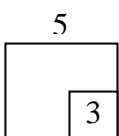


- 4 Find the range of values of  $x$  for which  $(x - 2)^2 \leq 8 - x$ . [3 marks]  
*Cari julat nilai  $x$  bagi  $(x - 2)^2 \leq 8 - x$ . [3 markah]*

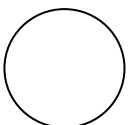


Answer / Jawapan: .....

- 
- 5 Given that  $\log_4 3y - \log_4 6x = 2$ , express  $y$  in terms of  $x$ . [3 marks]  
*Diberi  $\log_4 3y - \log_4 6x = 2$ , ungkapkan  $y$  dalam sebutan  $x$ . [3 markah]*



Answer / Jawapan: .....



- 6 Given that  $\log_4 x = p$ ,  $\log_{32} y = q$  and  $\frac{x}{y} = 2^{mp+nq}$ , find the value of  $m$  and  $n$ . [4 marks]

Diberi  $\log_4 x = p$ ,  $\log_{32} y = q$  dan  $\frac{x}{y} = 2^{mp+nq}$ , cari nilai bagi  $m$  dan  $n$ . [4 markah]

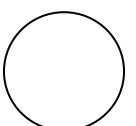
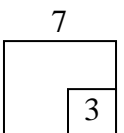
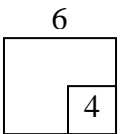
Answer / Jawapan:  $m = \dots\dots\dots n = \dots\dots\dots$

- 7 A piece of string of length 12 m is cut into 20 pieces in such a way that the lengths of the pieces are in arithmetic progressions. If the length of the longest piece is five times of the length of the shortest piece, find the length of the longest piece. [3 marks]

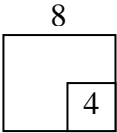
Seutas dawai yang panjangnya 12 m dipotong kepada 20 keratan dengan keadaan ukuran keratan membentuk satu janting aritmetik. Jika ukuran keratan terpanjang ialah lima kali keratan terpendek, cari ukuran keratan terpanjang. [3 markah]

Answer / Jawapan: .....

[Lihat sebelah

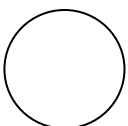
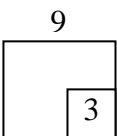


- 8 The fourth and seventh terms of a geometric progression are 18 and 486 respectively. Find the third term. [4 marks]  
*Sebutan keempat dan ketujuh bagi satu jantang geometri masing-masing ialah 18 dan 486. Cari sebutan ketiga. [4 markah]*



Answer / Jawapan: .....

- 9 Point  $P(h, 7)$  divides line the segment joining the points  $E(3, 10)$  and  $F(8, k)$  internally such that  $EP : PF = 1 : 4$ . Find the values of  $h$  and  $k$ . [3 marks]  
*Titik  $P(h, 7)$  membahagi dalam tembereng garis yang menyambungkan titik  $E(3,10)$  dan  $F(8, k)$  dengan keadaan  $EP : PF = 1 : 4$ . Cari nilai bagi  $h$  dan  $k$ . [3 markah]*



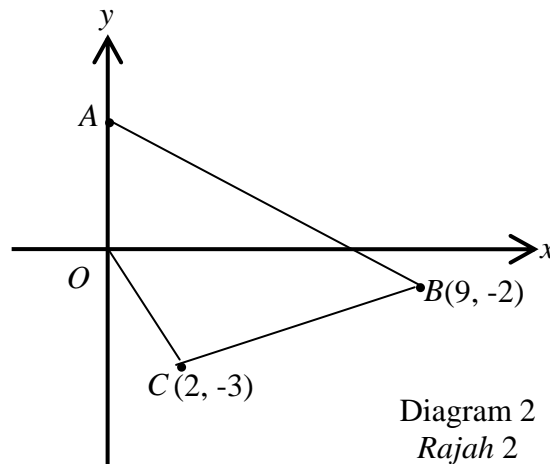
Answer / Jawapan:  $h = \dots\dots\dots$   $k = \dots\dots\dots$

- 10** *Solution to this question by scale drawing will not be accepted.  
Penyelesaian secara lukisan berskala tidak diterima.*

In Diagram 2,  $OABC$  is a quadrilateral. The equation of the straight line  $AB$  is

$$\frac{x}{6} + \frac{y}{4} = 1.$$

*Dalam Rajah 2,  $OABC$  adalah sebuah sisiempat. Persamaan bagi garis lurus  $AB$  ialah  $\frac{x}{6} + \frac{y}{4} = 1$ .*

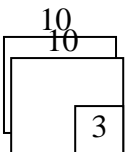


Find the area of the quadrilateral  $OABC$ .  
Cari luas bagi sisiempat  $OABC$ .

[3 marks]

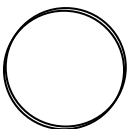
[3 markah]

Answer / Jawapan: .....



**Lihat sebelah**

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For  
Examiner's  
Use

- 11 Given  $\vec{a} = 4\vec{i} - 6\vec{j}$ ,  $\vec{b} = \vec{i} - \vec{j}$  and  $\vec{c} = \frac{1}{2}\vec{a} - \vec{b}$ , express  $\vec{c}$  in the form  $x\vec{i} + y\vec{j}$ . [2 marks]  
 Diberi  $\vec{a} = 4\vec{i} - 6\vec{j}$ ,  $\vec{b} = \vec{i} - \vec{j}$  dan  $\vec{c} = \frac{1}{2}\vec{a} - \vec{b}$ , ungkapkan  $\vec{c}$  dalam bentuk  $x\vec{i} + y\vec{j}$  [2 markah]

Answer / Jawapan:  $\vec{c} = \dots\dots\dots$

11

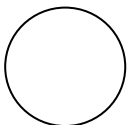
2

- 12 The vector  $\vec{OF}$  has a magnitude of 10 unit and has the same direction as  $\vec{OE}$ .  
 Given that  $\vec{OE} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$  and  $\vec{OF} = \begin{pmatrix} x \\ y \end{pmatrix}$ , find the value of  $x$  and  $y$ . [3 marks]  
 Vector  $\vec{OF}$  mempunyai magnitude 10 unit dan mempunyai arah yang sama dengan  $\vec{OE}$ . Diberi  $\vec{OE} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$  dan  $\vec{OF} = \begin{pmatrix} x \\ y \end{pmatrix}$ , cari nilai  $x$  dan nilai  $y$ . [3 markah]

Answer / Jawapan:  $x = \dots\dots\dots y = \dots\dots\dots$

12

4



- 13 Diagram 3 shows a triangle  $ABC$ .  
Rajah 3 menunjukkan sebuah segitiga  $ABC$ .

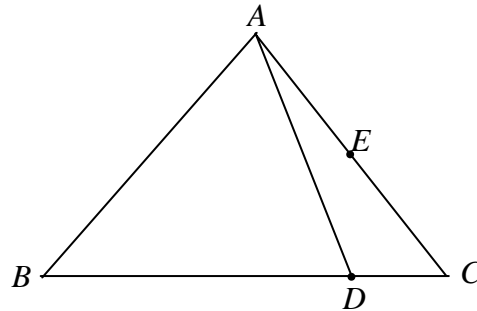


Diagram 3  
Rajah 3

The point  $E$  is the midpoint of  $AC$  and  $D$  lies on the line  $BC$  such that  $BC = 5DC$ .  
Given  $\vec{AB} = \vec{x}$  and  $\vec{BC} = 5\vec{y}$ , express in term of  $\vec{x}$  and  $\vec{y}$ ,

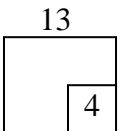
Titik  $E$  ialah titik tengah bagi  $AC$  dan  $D$  terletak pada garis  $BC$  dengan keadaan  $BC = 5DC$ . Diberi  $\vec{AB} = \vec{x}$  dan  $\vec{BC} = 5\vec{y}$ , ungkapkan dalam sebutan

$\vec{x}$  dan  $\vec{y}$ ,

- (a)  $\vec{AD}$ ,  
(b)  $\vec{DE}$ .

[4 marks]  
[4 markah]

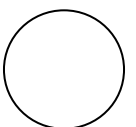
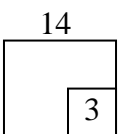
Answer / Jawapan: (a) .....  
(b) .....



- 14 Find the value of  $\lim_{x \rightarrow 2} \frac{x^2 - 3x}{x^2 - 4x + 3}$ . [2 marks]

Cari nilai bagi had  $\frac{x^2 - 3x}{x^2 - 4x + 3}$ . [2 markah]

Answer / Jawapan: .....



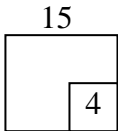
- 15 Volume,  $V \text{ cm}^3$ , of a solid is given by  $V = 8\pi r^2 + \frac{2}{3}\pi r^3$ ,  $r$  is the radius. Find the approximate change in  $V$  if  $r$  increases from 3 cm to 3.005 cm. (Give your answers in terms of  $\pi$ ).

*Isipadu,  $V \text{ cm}^3$ , bagi sebuah pepejal diberi oleh  $V = 8\pi r^2 + \frac{2}{3}\pi r^3$ ,  $r$  ialah jejari.*

*Cari perubahan hampir bagi  $V$  jika  $r$  bertambah daripada 3 cm kepada 3.005 cm. (Beri jawapan anda dalam sebutan  $\pi$ ).*

[4 marks]

[4 markah]



Answer / Jawapan : .....

- 16 Diagram 4 shows part of a straight line graph drawn to represent linear form of the equation  $y = \frac{625}{x}$ .

*Rajah 4 menunjukkan sebahagian daripada graph garis lurus yang dilukis untuk mewakili bentuk linear bagi persamaan  $y = \frac{625}{x}$ .*

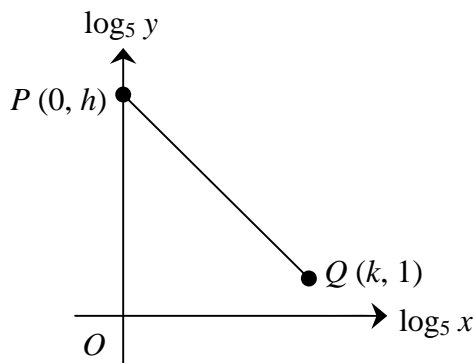
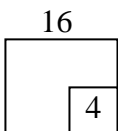


Diagram 4  
Rajah 4

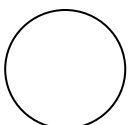
Find the values of  $h$  and  $k$ .  
*Cari nilai bagi  $h$  dan  $k$ .*

[4 marks]

[4 markah]



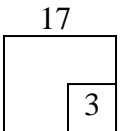
Answer / Jawapan:  $h = \dots\dots\dots k = \dots\dots\dots$



17 Find the value of  $\int_{-1}^1 \frac{(6+x)(6-x)}{x^4} dx$ . [3 marks]

Cari nilai  $\int_{-1}^1 \frac{(6+x)(6-x)}{x^4} dx$ . [3 markah]

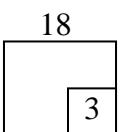
Answer / Jawapan: .....



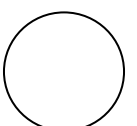
18 The gradient function of a curve passing through (1, 2) is given by  $\frac{1}{(3x-4)^2}$ .  
Find the equation of the curve. [3 marks]

Fungsi kecerunan suatu lengkung yang melalui (1, 2) diberi oleh  $\frac{1}{(3x-4)^2}$ . Cari persamaan lengkung itu. [3 markah]

Answer / Jawapan: .....



[Lihat sebelah





- 19 In Diagram 5,  $OAC$  is a right-angled triangle and  $OAB$  is a sector of a circle with centre  $A$ .  
 Dalam Rajah 5,  $OAC$  ialah sebuah segitiga tegak dan  $OAB$  ialah sebuah sektor bulatan berpusat  $A$ .

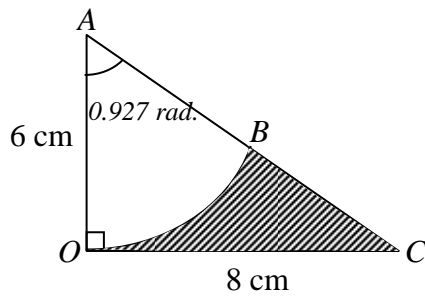
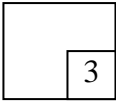


Diagram 5  
Rajah 5

Given that  $OA = 6 \text{ cm}$ ,  $OC = 8 \text{ cm}$  and  $\angle OAB = 0.927 \text{ rad}$ , find the area of the shaded region. [3 marks]

Diberi  $OA = 6 \text{ cm}$ ,  $OC = 8 \text{ cm}$  dan  $\angle OAB = 0.927 \text{ rad}$ , cari luas rantau berlorek. [3 markah]

19



Answer / Jawapan: .....

- 20 Given that  $\cos 70^\circ = h$  and  $\sin 35^\circ = k$ , express in terms of  $h$  and/or  $k$

- (a)  $\cos 140^\circ$ ,  
 (b)  $\sin 105^\circ$

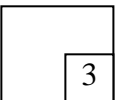
[3 marks]

Given that  $\cos 70^\circ = h$  and  $\sin 35^\circ = k$ , express in terms of  $h$  and/or  $k$ ,

- (a)  $\cos 140^\circ$ ,  
 (b)  $\sin 105^\circ$ .

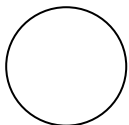
[3 markah]

20



Answer / Jawapan: (a) .....

(b) .....



21 Solve the equation  $3\sec^2 x - 4\tan x - 2 = 0$  for  $0^\circ \leq x \leq 360^\circ$ . [4 marks]

*Selesaikan persamaan  $3\sec^2 x - 4\tan x - 2 = 0$  bagi  $0^\circ \leq x \leq 360^\circ$*  [4 markah]

Answer / Jawapan: .....

21	
	4

22 Five boys and four girls are to stand in a line. Calculate the number of possible arrangements if

- (a) there is no restriction,  
(b) no two boys are to stand beside each other.

[3 marks]

*Lima orang lelaki dan empat orang perempuan berdiri pada satu baris. Kira bilangan susunan yang mungkin jika*

- (a) *tiada syarat yang dikenakan,*  
(b) *tiada dua orang lelaki yang berdiri sebelah menyebelah.*

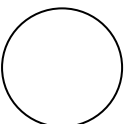
[3 markah]

Answer / Jawapan: (a) .....

(b) .....

22	
	3

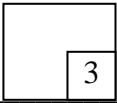
[Lihat sebelah



- 23** Lee will play against players  $E$ ,  $F$  and  $G$  in a badminton competition. The probabilities that Lee will beat  $E$ ,  $F$  and  $G$  are  $\frac{5}{6}$ ,  $\frac{3}{4}$  and  $\frac{2}{3}$  respectively. Calculate the probability that Lee will beat at least two of the three players. [3 marks]

*Lee akan berlawan dengan pemain  $E$ ,  $F$  dan  $G$  dalam satu pertandingan badminton. Kebarangkalian bahawa Lee akan mengalahkan  $E$ ,  $F$  dan  $G$  masing-masing ialah  $\frac{5}{6}$ ,  $\frac{3}{4}$  dan  $\frac{2}{3}$ . Hitungkan kebarangkalian bahawa Lee akan mengalahkan sekurang-kurang dua daripada tiga orang pemain. [3 markah]*

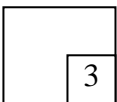
23



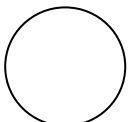
Answer / Jawapan : .....

- 24** In an examination, 40 % of the students passed. If a sample of 10 students is randomly selected, find the probability that less than 2 students passed. [3 marks]  
*Dalam satu peperiksaan, didapati 40 % daripada pelajar lulus. Jika satu sampel 10 orang pelajar dipilih secara rawak, cari kebarangkalian bahawa kurang daripada 2 orang pelajar lulus. [3 makah]*

24



Answer / Jawapan: .....



- 25 Diagram 7 shows a standardised normal distribution graph.  
Rajah 7 menunjukkan satu graf taburan normal piawai.

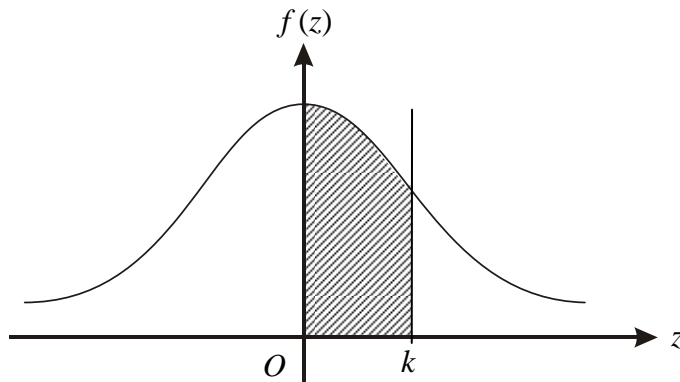


Diagram 7  
Rajah 7

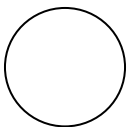
Given that the area of the shaded region is 30.5 % of the total area under the curve, find  
Diberi bahawa luas rantau berlorek ialah 30.5 % daripada keseluruhan luas rantau dibawah lengkung, cari

- (a)  $P(z < k)$ ,  
(b) the value of  $k$ ,  
cari nilai  $k$ .

[3 marks]  
[3 markah]

Answer / Jawapan: (a) .....  
(b) .....

25
3



**END OF QUESTION PAPER**  
**KERTAS SOALAN TAMAT**