

SULIT**JPNP PAHANG**

NAMA		TINGKATAN	
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PEPERIKSAAN PERCUBAAN SPM TAHUN 2008**3472/1****ADDITIONAL MATHEMATICS****Kertas 1****September**

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.*

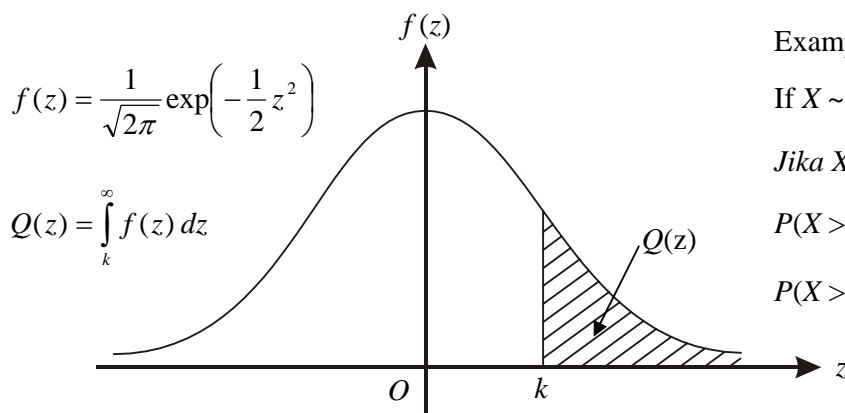
<i>Untuk Kegunaan Pemeriksa</i>		
Kod Pemeriksa:		
Soalan	Markah Penuh	Markah Diperoleh
1	2	
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3	3	
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7	3	
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9	3	
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11	2	
12	4	
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21	4	
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23	3	
24	3	
25	3	
Jumlah	80	

Kertas soalan ini mengandungi 20 halaman bercetak.

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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



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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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 Area under a curve

Luas di bawah lengkung

$$= \int_a^b y dx \text{ or (atau)}$$

$$= \int_a^b x dy$$

5 Volume generated

Isipadu janaan

$$= \int_a^b \pi y^2 dx \text{ or (atau)}$$

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

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STATISTICS / STATISTIK

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GEOMETRY / GEOMETRI

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

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

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

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

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

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

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

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

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

TRIGONOMETRY / TRIGONOMETRI

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

$\cos 2A = \cos^2 A - \sin^2 A$
$= 2 \cos^2 A - 1$
$= 1 - 2 \sin^2 A$ | 14 | Area of triangle / <i>Luas segitiga</i>
$= \frac{1}{2}ab \sin c$ |

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

- 1** Diagram 1 shows the linear relation f .
Rajah 1 menunjukkan hubungan linear f .

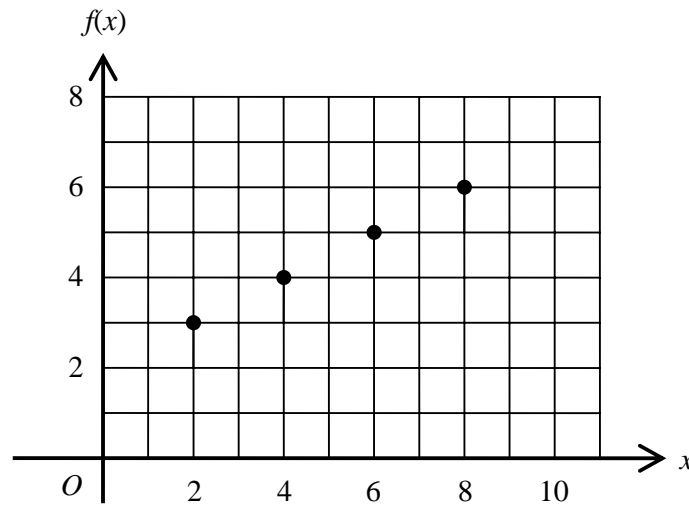
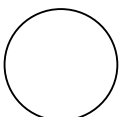
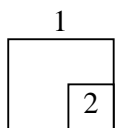


Diagram 1
Rajah 1

- (a) If the image of 6 is q , state the value of q .
Jika imej bagi 6 ialah q , nyatakan nilai q .
- (b) State the type of relation as shown in Diagram 1.
Nyatakan jenis hubungan yang ditunjukkan dalam Rajah 1.

[2 marks]
[2 markah]



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Answer / *Jawapan*: (a) $q = \dots\dots\dots$
(b) $\dots\dots\dots$

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2 Given the function $h : x \rightarrow \frac{3-x}{2}$, find

Diberi fungsi $h : x \rightarrow \frac{3-x}{2}$, cari

(a) the composite function h^2 ,
fungsi gubahan h^2 ,

[2 marks]

[2 markah]

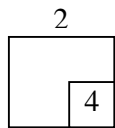
(b) the inverse function, $h^{-1}(x)$.
fungsi songsangan, $h^{-1}(x)$.

[2 marks]

[2 markah]

Answer / Jawapan: (a)

(b)



3 The quadratic equation $px^2 + (q + 1)x + 1 - q^2 = 0$, where p and q are constants, has two real and distinct roots. Express the range of value of p in terms of q .

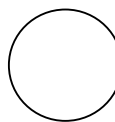
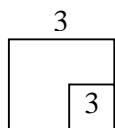
Persamaan kuadratik $px^2 + (q + 1)x + 1 - q^2 = 0$, dengan keadaan p dan q ialah pemalar, mempunyai dua punca nyata dan berbeza.

Ungkapkan julat nilai p dalam sebutan q .

[3 marks]

[3 markah]

Answer / Jawapan:



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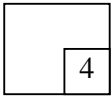
4 Find the range of values of x for which $3(2x^2 - x) \leq 1 - 2x$.

[4 marks]

Cari julat nilai x bagi $3(2x^2 - x) \leq 1 - 2x$.

[4 markah]

4



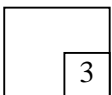
Answer / Jawapan:

5 Given that $3\log_{10}(xy^2) = 4 + 2\log_{10} y - \log_{10} x$, find the value of $\log_{10} xy$. [3 marks]

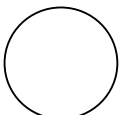
Diberi $3\log_{10} xy^2 = 4 + 2\log_{10} y - \log_{10} x$, cari nilai $\log_{10} xy$.

[3 markah]

5



Answer / Jawapan:

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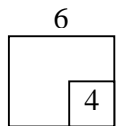
6 Given that $2^x \times 3^x = 5^{x+2}$, find the value of x .

[4 marks]

Diberi $2^x \times 3^x = 5^{x+2}$, cari nilai bagi x .

[4 markah]

Answer / Jawapan:



7 The following sequence is an arithmetic progression.

Jujukan berikut ialah satu jangjang aritmetik.

$$2p + q, 3p + 2q, 4p + 3q, \dots$$

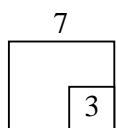
Find S_{10} in terms of p and q .

[3 marks]

Cari S_{10} dalam sebutan p dan q .

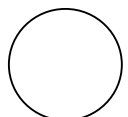
[3 markah]

Answer / Jawapan: $S_{10} =$



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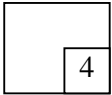
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- 8** (a) The first three consecutive terms of a geometric progression are $a, 6, 18$.
Find the ninth term. [2 marks]
*Tiga sebutan pertama suatu janjang geometri ialah $a, 6, 18$.
Cari sebutan ke sembilan.* [2 markah]
- (b) Express the recurring decimal $1.\dot{0}\dot{2}$ as a fraction in the lowest form. [2 marks]
Ungkapkan perpuluhan berulang $1.\dot{0}\dot{2}$ sebagai satu pecahan tunggal yang termudah. [2 markah]

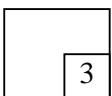
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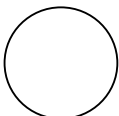
Answer / Jawapan: (a)
(b)

- 9** P, Q and R are three points on the straight line $2y - x = 4$. Given $PQ : QR = 1 : 4$,
 Q is $(2, 3)$ and P is on the y -axis, find R . [3 marks]
 *P, Q dan R ialah tiga titik pada garis lurus $2y - x = 4$. Diberi $PQ : QR = 1 : 4$,
 Q ialah $(2, 3)$ dan P ada pada paksi- y , cari R .* [3 markah]

9



Answer / Jawapan:



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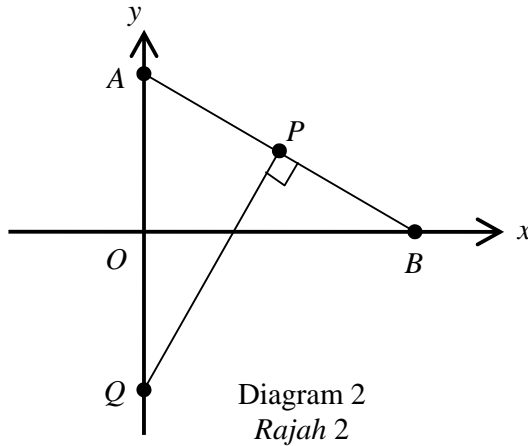
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- 10** In Diagram 2, the straight lines AB and PQ are perpendicular to each other and P is the midpoint of AB .
Given $A(0, 4)$, $B(8, 0)$ and $Q(0, k)$, determine the value of k . [3 marks]

*Dalam Rajah 2, garis lurus AB dan PQ adalah berserenjang kepada satu sama lain dan P ialah titik tengah AB .
Diberi $A(0, 4)$, $B(8, 0)$ dan $Q(0, k)$, tentukan nilai bagi k . [3 markah]*

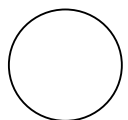


Answer / Jawapan:

10
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SULIT**12****3472/1**

- 11 Given $\underline{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ and $\overrightarrow{OA} = 2\underline{b} - \underline{a}$. Express \overrightarrow{OA} in the form $\begin{pmatrix} x \\ y \end{pmatrix}$.
[2 marks]

Diberi $\underline{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ dan $\underline{b} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$. Ungkapkan \overrightarrow{OA} dalam bentuk $\begin{pmatrix} x \\ y \end{pmatrix}$, jika
 $\overrightarrow{OA} = 2\underline{b} - \underline{a}$. [2 markah]

11

2

Answer / Jawapan: $\overrightarrow{OA} = \dots\dots\dots$

- 12 *Solution by graph is not accepted for this question.*
Penyelesaian secara graf tidak diterima bagi soalan ini.

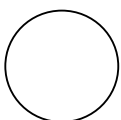
$OABC$ is a parallelogram such that $\overrightarrow{OA} = 4\underline{i} + 3\underline{j}$ and $\overrightarrow{OC} = 11\underline{i} + 5\underline{j}$
find the unit vector in the direction of \overrightarrow{OB} . [3 marks]

$OABC$ ialah sebuah segiempat selari dengan keadaan $\overrightarrow{OA} = 4\underline{i} + 3\underline{j}$
dan $\overrightarrow{OC} = 11\underline{i} + 5\underline{j}$, cari vektor unit pada arah \overrightarrow{OB} . [3 markah]

12

3

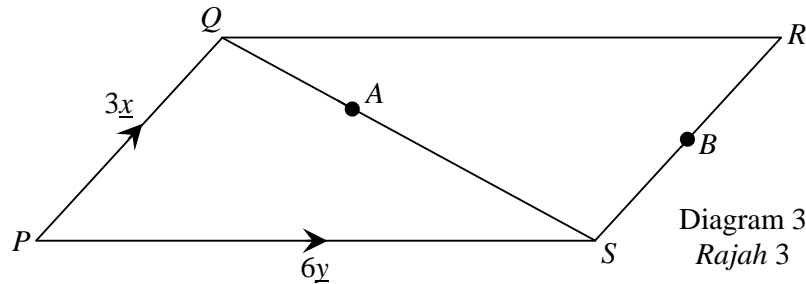
Answer / Jawapan: $\dots\dots\dots$

**34/72/1**
SULIT**13****SULIT**
3472/1

For
Examiner's
Use

- 13** Diagram 3 shows a parallelogram $PQRS$. Given that A lies on the diagonal QS such that $2QA = AS$ and B is the midpoint of RS , express \vec{AB} in terms of \underline{x} and \underline{y} . [4 marks]

Rajah 3 menunjukkan sebuah segiempat selari $PQRS$. Diberi A terletak pada pepenjuru QS dengan keadaan $2QA = AS$ dan B ialah titik tengah RS , ungkapkan \vec{AB} dalam sebutan \underline{x} dan \underline{y} . [4 markah]



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

13
4

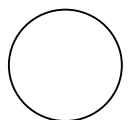
- 14** Given $f(x) = (5 - 3x)^4$, find $f''(2)$. [3 marks]
Diberi $f(x) = (5 - 3x)^4$, cari $f''(2)$. [3 markah]

Answer / Jawapan: $\dots\dots\dots$

14
3

3472/1

[Lihat sebelah
SULIT



SULIT

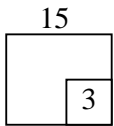
14

3472/1

- 15** Two variables p and q are related by the equation $p = 3q + \frac{2}{q}$. Given q increases at a constant rate of 4 units per second when $p = 2$, find the rate of change in p .

Dua pembolehubah p dan q dihubung dengan persamaan $p = 3q + \frac{2}{q}$. Diberi q bertambah dengan kadar malar 4 unit sesaat apabila $p = 2$, cari kadar perubahan bagi p .

[3 marks]
[3 markah]



Answer / Jawapan :

- 16** A straight line graph is obtained by plotting $\log_{10} y$ against $\log_{10} x$, as shown in Diagram 4. Find y in terms of x . [4 marks]

Graf garis lurus diperolehi dengan memplotkan $\log_{10} y$ melawan $\log_{10} x$, seperti yang ditunjukkan pada Rajah 4. Cari y dalam sebutan x . [4 markah]

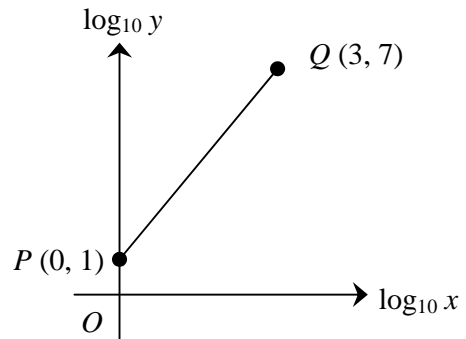
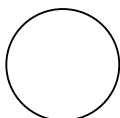
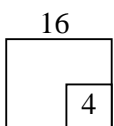


Diagram 4
Rajah 4



Answer / Jawapan:

34/72/1

SULIT

SULIT

15

3472/1

*For
Examiner's
Use*

17 Given $y = \frac{k}{(2x-5)^3}$ and $\frac{dy}{dx} = g(x)$, find the value of k if $\int_2^3 [g(x)+1]dx = 7$.

[3 marks]

Diberi $y = \frac{k}{(2x-5)^3}$ dan $\frac{dy}{dx} = g(x)$, cari nilai bagi k jika $\int_2^3 [g(x)+1]dx = 7$.

[3 markah]

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

17
3

18 The gradient function of a curve passing through (1, 2) is given by $(3 - 2x)^3$, find the equation of the curve.

[3 marks]

Fungsi kecerunan suatu garis lengkung yang melalui (1, 2) diberi sebagai $(3 - 2x)^3$, cari persamaan garis lengkung itu.

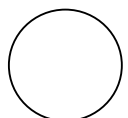
[3 markah]

Answer / Jawapan: $\dots\dots\dots$

18
3

3472/1

**[Lihat sebelah
SULIT**



For
Examiner's
Use

SULIT

16

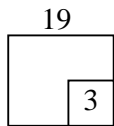
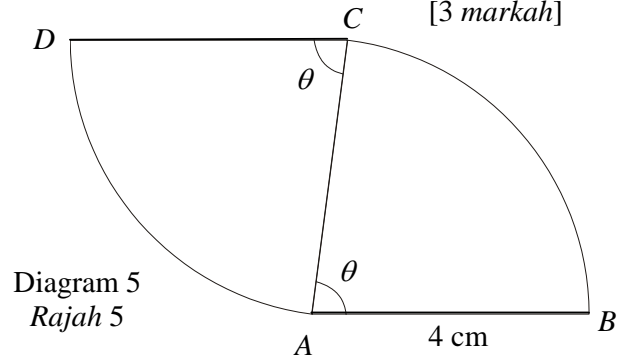
3472/1

- 19** Diagram 5 shows a four-sided figure $ABCD$. ABC and CDA are two congruent sectors centred at A and C respectively. Given that the area of sector ABC is 12 unit^2 and the length of AB is 4 cm , find the perimeter of the figure $ABCD$.

[3 marks]

Rajah 5 menunjukkan satu bentuk empat sisi $ABCD$. ABC dan CDA ialah dua sektor yang kongruen dengan pusat A dan C masing-masing. Diberi luas sector ABC ialah 12 unit^2 dan panjang AB ialah 4 cm , cari perimeter $ABCD$.

[3 markah]



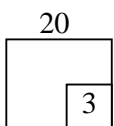
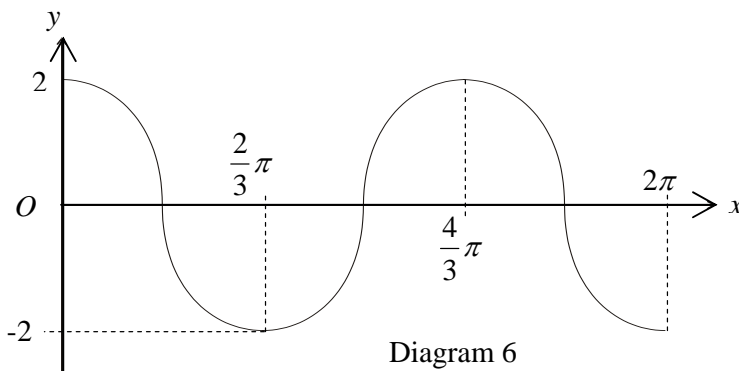
Answer / Jawapan:

- 20** Diagram 6 shows the graph of a curve $y = c + a \cos bx$ for $0 \leq x \leq 2\pi$, where a , b and c are constants. Determine the values of a , b and c .

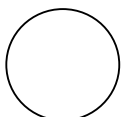
[3 marks]

Rajah 6 menunjukkan graf suatu garis lengkung $y = c + a \cos bx$ bagi $0 \leq x \leq 2\pi$, di mana a , b dan c ialah pemalar. Tentukan nilai a , b dan c .

[3 markah]



Answer / Jawapan: $a = \dots$, $b = \dots$, $c = \dots$



34/72/1

SULIT

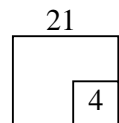
SULIT**17****3472/1***For
Examiner's
Use***21** Solve the equation $3\cos^2 x + \sin 2x = 0$ for $0^\circ \leq x \leq 360^\circ$

[4 marks]

Selesaikan persamaan $3\cos^2 x + \sin 2x = 0$ bagi $0^\circ \leq x \leq 360^\circ$

[4 markah]

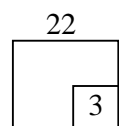
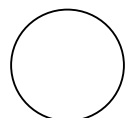
Answer / Jawapan:



22 12 students are shortlisted to participate in three competitions. 4 students are required to take part in a sudoku competition, 3 students are required to take part in a chess competition and another 2 students are required to take part in a quiz competition. Find the number of ways these students can be chosen if a student can only participate in one competition only. [3 marks]

12 orang pelajar telah disenarai pendek untuk menyertai 3 pertandingan. 4 orang pelajar diperlukan untuk menyertai pertandingan sudoku, 3 orang pelajar diperlukan untuk menyertai pertandingan catur dan 2 orang pelajar diperlukan untuk menyertai pertandingan kuiz. Cari bilangan cara pemilihan pelajar-pelajar tersebut jika seorang pelajar hanya dibenarkan untuk menyertai satu pertandingan sahaja. [3 markah]

Answer / Jawapan:

**3472/1****[Lihat sebelah
SULIT**

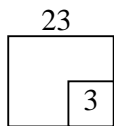
SULIT

18

3472/1

- 23** Bag *A* contain 1 green pen, 2 red pens and 3 blue pens. Bag *B* contain 2 black erasers and 3 white erasers. Bag *C* contain 6 gift cards labeled 1, 2, 3, 4, 5 and 6. An item is picked randomly from each bag. Find the probability of picking a blue pen, a black eraser and a gift card with a number smaller than 3. [3 marks]

Beg A mengandungi 1 pen hijau, 2 pen merah dan 3 pen biru. Beg B mengandungi 2 pemadam hitam dan 3 pemadam putih. Beg C mengandungi 6 kad hadiah yang dilabel 1, 2, 3, 4, 5 dan 6. Satu item dicabut secara rawak daripada setiap beg. Cari kebarangkalian mendapat satu pen biru, satu pemadam hitam dan satu kad hadiah yang berlabel nombor kurang daripada 3. [3 markah]



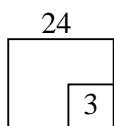
Answer / Jawapan :

- 24** The probability that it will rain on a particular day is $\frac{2}{5}$.

Kebarangkalian bahawa hujan akan turun pada sebarang hari ialah $\frac{2}{5}$.

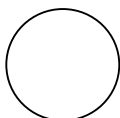
If *X* is the number of rainy days in a week, find
Jika X ialah bilangan hari berhujan dalam seminggu, cari

- (a) the mean of the distribution of *X*,
min bagi taburan X,
- (b) the standard deviation of the distribution of *X*.
sisihan piawai bagi taburan X.



Answer / Jawapan: (a)

(b)



34/72/1

SULIT

SULIT

19

3472/1

*For
Examiner's
Use*

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

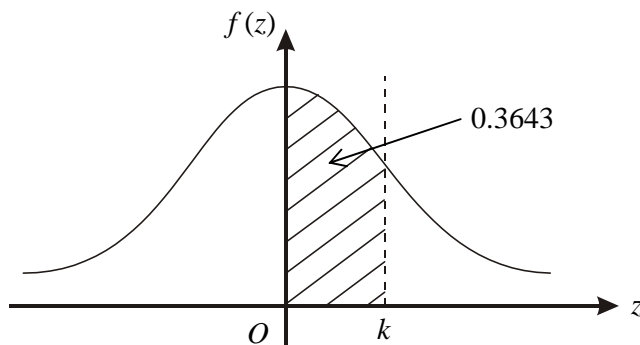


Diagram 7
Rajah 7

The probability represented by the area of the shaded region is 0.3643.
Kebarangkalian yang diwakili oleh luas kawasan berlorek ialah 0.3643.

- (a) Find the value of k .
Cari nilai k .
- (b) X is a continuous random variable which is normally distributed with a mean of μ and a standard deviation of 8.
Find the value of μ if $X = 70$ when the z -score is k .

X ialah pembolehubah rawak selanjar bertaburan secara normal dengan min μ dan sisihan piawai 8.

Cari nilai μ jika $X = 70$ apabila skor- z ialah k .

[3 marks]
[3 markah]

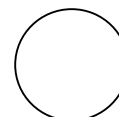
Answer / *Jawapan:* (a)
(b)

25
3

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

3472/1

SULIT



SULIT**20****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.

3472/1**SULIT**

JPNP PAHANG

SULIT
3472/1
Additional
Mathematics
Kertas 1
Peraturan
Pemarkahan
September
2008

PEPERIKSAAN PERCUBAAN SPM
TAHUN 2008

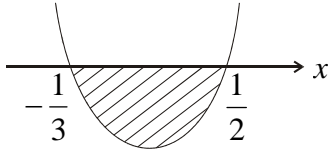
ADDITIONAL MATHEMATICS

KERTAS 1

PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

JPNP PAHANG

Question	Working / Solution	Marks	Total
1 (a)	$q = 5$	1	
1 (b)	one to one or 1 to 1	1	2
2 (a)	$\frac{3+x}{4}$ or equivalent	2	
	$3 - \frac{3-x}{2}$	B1	
2(b)	$3 - 2x$	2	
	$x = 3 - 2y$ or equivalent	B1	4
3	$p < \frac{q+1}{4(1-q)}$	3	
	$4p < \frac{(q+1)^2}{1-q^2}$ or equivalent (gathering of q terms)	B2	
	$(q+1)^2 - 4p(1-q^2)$	B1	3
4	$-\frac{1}{3} \leq x \leq \frac{1}{2}$ or $-0.3333 \leq x \leq 0.5$	4	
	$-\frac{1}{3} < x < \frac{1}{2}$ OR 	B3	
	Must indicate the range correctly by shading or other ways		
	$x = -\frac{1}{3}$ and $x = \frac{1}{2}$	B2	
	(both values must be seen)		
	$(3x+1)(2x-1)$	B1	4
	Accept '=' or any inequality signs '>', '<', '≤', '≥'		

JPNP PAHANG

5	1 $\log_{10} \frac{x^4 y^6}{y^2} = 4$ or $\log_{10} \frac{x^3 y^6}{y^2} + \log_{10} x = 4$ or $\log_{10} x^4 y^6 - \log_{10} y^2 = 4$ or $\log_{10} x^3 y^6 + \log_{10} \frac{x}{y^2} = 4$ or equivalent (combining at least two terms of log correctly in a correct equation) $\log_{10} x^3 y^6$ or $\log_{10} y^2$ or $\log_{10} 10^4$	3 B2 B1	3
6	17.65 or 17.63 $x = \frac{\log_{10} 25}{\log_{10} 1.2}$ or $x = \frac{2 \log_{10} 5}{\log_{10} 6 - \log_{10} 5}$ or equivalent $\log_{10} \left(\frac{6}{5}\right)^x = \log_{10} 25$ or $\log_{10} 6^x = \log_{10} 5^{x+2}$ or $\log_{10} (3^x \times 2^x) = (x+2) \log_{10} 5$ or equivalent 6^x or $5^x (5^2)$ or $\log_{10} (3^x \times 2^x) = \log_{10} 5^{x+2}$	4 B3 B2 B1	4
7	5(13p + 11q) or equivalent $\frac{10}{2}[2(2p + q) + (10 - 1)(p + q)]$ $3p + 2q - (2p + q)$ or $4p + 3q - (3p + 2q)$	3 B2 B1	3
8 (a)	13122 $a = 2$ or $r = 3$ or seen	2 B1	
8(b)	$1\frac{2}{99}$ or equivalent $a = 0.02$ and $r = 0.01$ or seen	2 B1	4

JPNP PAHANG

9	$(10, 7)$ $\frac{4(0)+1(h)}{1+4} = 2$ or $\frac{4(2)+1(k)}{1+4} = 3$ $P(0, 2)$	3 B2 B1	3
10	-6 $mPQ = 2$ $P(4, 2)$	3 B2 B1	3
11	$\begin{pmatrix} 4 \\ 5 \end{pmatrix}$ $2\begin{pmatrix} 3 \\ 1 \end{pmatrix} - \begin{pmatrix} 2 \\ -3 \end{pmatrix}$	2 B1	2
12	$\frac{1}{17}(15\mathbf{i} + 8\mathbf{j})$ or equivalent $\sqrt{15^2 + 8^2}$ $4\mathbf{i} + 3\mathbf{j} + 11\mathbf{i} + 5\mathbf{j}$	3 B2 B1	3
13	$-\frac{1}{2}\mathbf{x} + 4\mathbf{y}$ $\frac{2}{3}(6\mathbf{y} - 3\mathbf{x}) + \frac{1}{2}(3\mathbf{x})$ or equivalent $\overrightarrow{AS} = \frac{2}{3}(6\mathbf{y} - 3\mathbf{x})$ $(6\mathbf{y} - 3\mathbf{x})$ or $\frac{1}{2}(3\mathbf{x})$ or $AS = \frac{2}{3}QS$	4 B3 B2 B1	4

JPNP PAHANG

14	108 $3(-12)(5-3x)^2(-3)$ or equivalent $4(5-3x)^3(-3)$ or equivalent	3 B2 B1	3
15	10 $\frac{dp}{dt} = \left(3 - \frac{2}{2^2}\right) \times 4$ $\frac{dp}{dq} = 3 - \frac{2}{q^2}$ or equivalent	3 B2 B1	3
16	$y = 10x^2$ $\log_{10} y = \log_{10} x^2 + \log_{10} 10$ or $\log_{10} \frac{y}{x^2} = 1$ or equivalent $\log_{10} y = 2\log_{10} x + 1$ $mPQ = 2$	4 B3 B2 B1	4
17	3 $\left[\frac{k}{(2x-5)^3}\right]_2^3 + [x]_2^3 = 7$ or equivalent $\int_2^3 g(x)dx + \int_2^3 dx = 7$	3 B2 B1	3
18	$y = -\frac{1}{8}(3-2x)^4 + 2\frac{1}{8}$ or equivalent $2 = -\frac{(3-2 \times 1)^4}{8} + c$ or equivalent $\frac{(3-2x)^4}{-2(4)}$ or equivalent	3 B2 B1	3

JPNP PAHANG

19	<p>20</p> $4 + 4\left(\frac{3}{2}\right) + 4 + 4\left(\frac{3}{2}\right) \text{ or equivalent}$ $12 = \frac{1}{2}(4^2)\theta$	3 B2 B1	3
20	<p>$a = 2, b = \frac{3}{2}, c = 0$</p> <p>Any two of a, b or c correct</p> <p>Any one of a, b or c correct</p>	3 B2 B1	3
21	<p>$90^\circ, 123.69^\circ (123^\circ 41'), 270^\circ, 303.69^\circ (303^\circ 41')$</p> $\cos x = 0 \text{ and } \tan x = -\frac{3}{2}$ $\cos x(3\cos x + 2\sin x) = 0$ $3\cos^2 x + 2\sin x \cos x = 0$	4 B3 B2 B1	4
22	<p>277200</p> ${}^{12}C_4 \times {}^8C_3 \times {}^5C_2 \text{ or } 495 \times 56 \times 10 \text{ or equivalent}$ ${}^{12}C_4 \text{ or } {}^8C_3 \text{ or } {}^5C_2 \text{ or } 495 \text{ or } 56 \text{ or } 10 \text{ or equivalent}$	3 B2 B1	3
23	<p>$\frac{1}{15}$ or an equivalent single fraction</p> $\frac{3}{6} \times \frac{2}{5} \times \frac{2}{6}$ $\frac{3}{6} \text{ or } \frac{2}{5} \text{ or } \frac{2}{6}$	3 B2 B1	3

JPNP PAHANG

24(a)	$\frac{14}{5}$ or 2.8	1	
24(b)	1.296	2	
	$7 \times \frac{2}{5} \times \left(1 - \frac{2}{5}\right)$ or equivalent	B1	3
25 (a)	1.1	1	
25(b)	61.2	2	
	$\frac{70 - \mu}{8} = *1.1$ (his k)	B1	3