NAMA : ..... TINGKATAN :.....

SULIT
3472/1
Additional
Mathematics
Paper 1
Ogos
2010
2 Jam

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2010

ANJURAN PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA SEKOLAH MENENGAH CAWANGAN NEGERI PERLIS

ADDITIONAL MATHEMATICS

Paper 1
Kertas 1

Two hours
Dua jam

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Tulis* **nama** *dan* **tingkatan** *anda pada ruangan yang disediakan.*
2. *Kertas soalan 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 soalan ini.*

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

Kertas soalan ini mengandungi 16 halaman bercetak

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 $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

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

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

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

6 $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

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

8 $\log_a b = \dfrac{\log_c b}{\log_c a}$

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

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

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

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

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

CALCULUS

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

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

3 $\dfrac{dy}{dx} = \dfrac{dy}{du} \times \dfrac{du}{dx}$

4 Area under a curve

Luas di bawah lengkung

$= \int_a^b y\,dx$ or (atau)

$= \int_a^b x\,dy$

5 Volume generated/*Isipadu janaan*

$= \int_a^b \pi y^2\,dx$ or (atau)

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

GEOMETRY

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

2 Midpoint/*Titik tengah*

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

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

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

4 Area of triangle/ *Luas segitiga*

$= \dfrac{1}{2}\left|(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)\right|$

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

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

STATISTICS/*STATISTIK*

1 $\bar{x} = \dfrac{\sum x}{N}$

2 $\bar{x} = \dfrac{\sum fx}{\sum f}$

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

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

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

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

7 $\bar{I} = \dfrac{\sum W_i I_i}{\sum W_i}$

8. ${}^nP_r = \dfrac{n!}{(n-r)!}$

9. ${}^nC_r = \dfrac{n!}{(n-r)!r!}$

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

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

12 Mean/ *Min*, $\mu = np$

13 $\sigma = \sqrt{npq}$

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

TRIGONOMETRY/ *TRIGONOMETRI*

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

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

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

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

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

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

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

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

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

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

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

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

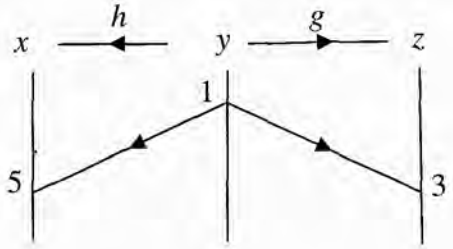
12 $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

14 Area of triangle/ *Luas segitiga*
$= \dfrac{1}{2} ab \sin C$

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

1. In diagram 1, the function h maps y to x and function g maps y to z.
Dalam rajah 1, *fungsi h memetakan y kepada x dan fungsi g memetakan y kepada z.*



Diagram/*Rajah* 1

Find
Cari

(a) $h\,(1)$,
(b) $gh^{-1}(5)$ [2 *marks* / *markah*]

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

(b) .....

---

2. Given the function $f^{-1}(x) = 3x + 5$ and $g(x) = x - 4$.
Diberi fungsi $f^{-1}(x) = 3x + 5$ *dan* $g(x) = x - 4$.

Find $fg(3)$.
Cari $fg(3)$.

[3 *marks* / *markah*]

Answer / *Jawapan* :.....

3. Given the function $f(x) = kx + 1$ and $g(x) = 3x + 5$, find
Diberi fungsi $f(x) = kx + 1$ *dan* $g(x) = 3x + 5$, *cari*

(a) $gf(x)$ in terms of k,
$gf(x)$ *dalam sebutan* k,

(b) the value of k if $gf(x) = \frac{5x+32}{4}$.
nilai k *jika* $gf(x) = \frac{5x+32}{4}$.

[3 *marks / markah*]

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

(b) .....

4. Solve the quadratic equation $3x+1 = 2x(x-3)$.
Selesaikan persamaan kuadratik $3x+1 = 2x(x-3)$.

Give your answer correct to four significant figures.
Beri jawapan anda sehingga empat angka bererti.

[3 *marks / markah*]

Answer / *Jawapan*: .....

5. Given that the curve of a quadratic function has a maximum point (4, –5).
Diberi bahawa lengkung bagi satu fungsi kuadratik mempunyai titik maksimum (4, –5).

(a) Find the equation of the function in the form $f(x)=(x-b)^2+c$, such that b and c are constants.
Cari persamaan fungsi itu dalam bentuk $f(x)=(x-b)^2+c$, *dengan keadaan* b *dan* c *ialah pemalar.*

(b) Find the y-intercept of the curve.
Cari pintasan y *bagi lengkung itu.*

[3 *marks / markah*]

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

(b) .....

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6. Find the range of values of x for which $5(x+1)>3x(x-3)$.
Cari julat nilai x *bagi* $5(x+1)>3x(x-3)$.

[3 *marks / markah*]

Answer / *Jawapan*: .....

7. Solve $5\left(5^{3x}\right)=\sqrt{625^{x-1}}$

Selesaikan $5\left(5^{3x}\right)=\sqrt{625^{x-1}}$

[3 *marks / markah*]

Answer / *Jawapan*: .....

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8. It is given that $\log_2 p = m$ and $\log_2 q = n$.

Diberi bahawa $\log_2 p = m$ *dan* $\log_2 q = n$.

Express $\log_4 \frac{32}{pq^2}$ in terms of m and n.

Ungkapkan $\log_4 \frac{32}{pq^2}$ *dalam sebutan m dan n.*

[4 *marks / markah*]

Answer / *Jawapan*: .....

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9. Solve $\log_x 9 = \frac{2}{3}$.

Selesaikan $\log_x 9 = \frac{2}{3}$

[3 *marks / markah*]

Answer / *Jawapan*: .....

10. The second term and the sixth term of a geometric progression are $\frac{1}{18}$ and $\frac{8}{729}$ respectively.

Sebutan kedua dan sebutan keenam suatu janjang geometri masing-masing ialah $\frac{1}{18}$ *dan* $\frac{8}{729}$.

Find
Cari

(a) the common ratio
nisbah sepunya janjang itu,

(b) the sum to infinity
hasiltambah hingga ketakterhinggaan.

[3 *marks* / *markah*]

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

(b) .....

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11. The first three terms of an arithmetic progression are $-5, -1$ and 3. Find
Tiga sebutan pertama satu janjang aritmetik ialah $-5, -1$ *dan* 3. *Cari*

(a) the sixth term,
sebutan keenam,

(b) the sum of the first seven terms after the sixth term.
hasiltambah tujuh sebutan pertama selepas sebutan keenam.

[4 *marks* / *markah*]

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

(b) .....

12. Diagram 12 shows a straight line graph of $\frac{y}{x}$ against x .

Rajah 12 *menunjukkan graf garis lurus bagi* $\frac{y}{x}$ *melawan* x

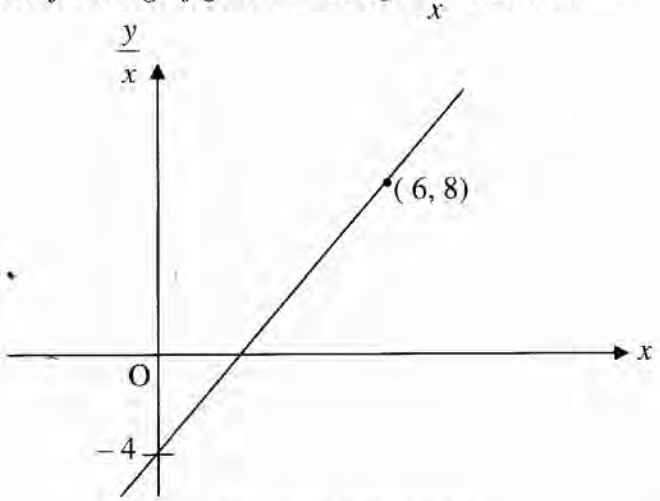

Diagram / *Rajah* 12

Express y in terms of x.
Ungkapkan y dalam sebutan x.

[3 *marks* / *markah*]

Answer / *Jawapan*: .....

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13. The equation of two lines are $4py + 5x - 6 = 0$ and $\frac{y}{6} + \frac{x}{5} + 3 = 0$ respectively

where p is a constant. Find the value of p if the straight lines are perpendicular to each other.

Persamaan dua garis lurus diberi sebagai $4py + 5x - 6 = 0$ *dan* $\frac{y}{6} + \frac{x}{5} + 3 = 0$ *di mana p adalah pemalar. Cari nilai p jika kedua-dua garis lurus itu berserenjang antara satu sama lain.*

[3 *marks* / *markah*]

Answer / *Jawapan*: .....

14. Given that $\overrightarrow{OA} = 3\underline{i} - 2\underline{j}$ and $\overrightarrow{OB} = -\underline{i} + \underline{j}$.
Diberi $\overrightarrow{OA} = 3\underline{i} - 2\underline{j}$ *dan* $\overrightarrow{OB} = -\underline{i} + \underline{j}$
Find
Cari
(a) $\overrightarrow{AB}$
(b) $|\overrightarrow{AB}|$

[3 *marks* / *markah*]

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

(b) .....

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15. Given that $\overrightarrow{PQ} = m\underline{i} + 5\underline{k}\underline{j}$ and $\overrightarrow{RS} = 2\underline{i} + 3\underline{j}$.
Diberi $\overrightarrow{PQ} = m\underline{i} + 5\underline{k}\underline{j}$ *dan* $\overrightarrow{RS} = 2\underline{i} + 3\underline{j}$.

Find the ratio of $m : k$ if $\overrightarrow{PQ}$ is parallel to $\overrightarrow{RS}$
Cari nisbah bagi $m : k$ *jika* $\overrightarrow{PQ}$ *selari dengan* $\overrightarrow{RS}$.

[4 *marks* / *markah*]

Answer / *Jawapan*: .....

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16. Given that $\sin x = k$, $90^o \le x \le 270^o$, express in terms of k,
Diberi bahawa $\sin x = k$, $90^o \le x \le 270^o$, *ungkapkan dalam sebutan* k,

(a) $\operatorname{cosec} x$,
(b) $\cos(\pi - x)$.

[3 *marks* / *markah*]

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

(b) .....

17. Diagram 17 shows a sector OPQ of a circle with centre O and radius OP.
Rajah 17 *menunjukkan sebuah sektor* OPQ *bagi sebuah bulatan berpusat* O *dan berjejari* OP.

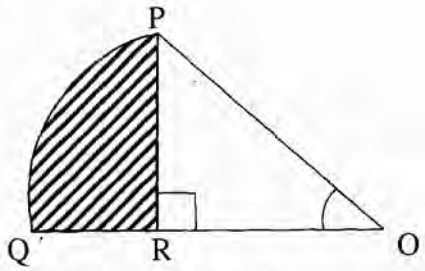

Diagram /*Rajah* 17

It is given that QR = 1 cm and PO = 13 cm.
Diberi bahawa QR = 1 cm *dan* PO = 13 cm

Calculate
Hitungkan
(a) $\angle POR$ in radians.
$\angle$ *POR dalam radian.*

(b) the perimeter of the shaded region.
perimeter kawasan berlorek.

[4 *marks* / *markah*]

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

(b) .....

18. Given that $\frac{dy}{dx} = 2x^2 - 5$ and $y = 1$ when $x = 3$.
Diberi bahawa $\frac{dy}{dx} = 2x^2 - 5$ *dan* $y = 1$ *apabila* $x = 3$.

Find y in terms of x.
Cari y *dalam sebutan* x.

[3 *marks* / *markah*]

Answer / *Jawapan:* .....

19. Given $f'(x) = (1-2x)(5-6x)$, determine $f''(x)$.
Diberi $f'(x) = (1-2x)(5-6x)$, *tentukan* $f''(x)$

[2 *marks* / *markah*]

Answer / *Jawapan*: .....

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20. Given the curve $y = 2x(3x-2)$, find the x-coordinate of the turning point.
Diberi persamaan lengkung $y = 2x(3x-2)$, *cari koordinat* – x *bagi titik pusingan*

[3 *marks* / *markah*]

Answer / *Jawapan*: .....

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21. Diagram 21 shows the graph of $y = f(x)$.
Rajah 21 *menunjukkan graf* $y = f(x)$.

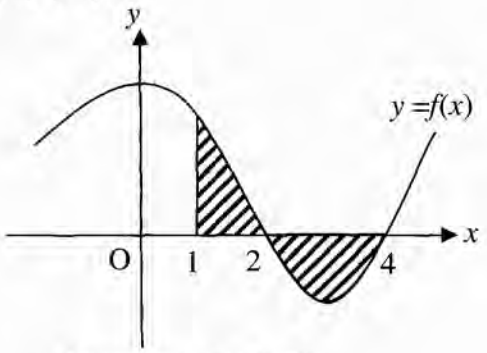

Diagram / *Rajah* 21

Given that $\int_1^2 f(x)\,dx = 3$ and the shaded area is 8 unit^2.
Diberi bahawa $\int_1^2 f(x)\,dx = 3$ *dan luas kawasan berlorek ialah* 8 *unit*^{2}.

Find the value of k if $\int_2^4 [f(x) + k\,]dx = 13$.
Cari nilai k *jika* $\int_2^4 [f(x) + k\,]dx = 13$.

[3 marks / *markah*]

Answer / *Jawapan*: .....

22. A set of positive integers consists of 2, 5 and k. The standard deviation for this set of integers is given as $\sqrt{6}$. Find the value of k.

Satu set nombor positif terdiri dari 2, 5 dan k. Sisihan piawai bagi set ini diberi sebagai $\sqrt{6}$. Cari nilai k.

[3 *marks / markah*]

Answer / *Jawapan*: .....

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23. The probability that it rains on Saturday is $\frac{2}{3}$, while the probability that it rains on Sunday is $\frac{5}{7}$.

Kebarangkalian bahawa hujan turun pada hari Sabtu ialah $\frac{2}{3}$, sementara kebarangkalian hujan turun pada hari Ahad ialah $\frac{5}{7}$.

Find the probability that,
Cari kebarangkalian bahawa

(a) it rains on any one of these two days.
hujan turun pada mana-mana hari bagi dua hari tersebut.

(b) there is no rain on any of these two days.
hujan tidak turun langsung pada mana-mana dua hari tersebut.

[4 *marks / markah*]

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

(b) .....

24. It is known that 5 % of a batch of components produced by a machine are defective. A random sample of 60 components is taken.
Adalah diketahui bahawa 5 % daripada sebilangan komponen yang dihasilkan oleh satu mesin adalah cacat. Satu sampel rawak sebanyak 60 komponen telah diambil.

Find / *Cari*

(a) the mean of the number of defective components in the sample.
min bagi bilangan komponen yang cacat.

(b) the variance of the number of defective components in the sample.
varians bagi bilangan komponen yang cacat.

[4 *marks* / *markah*]

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

(b) .....

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25. A continuous random variable X has a normal distribution with mean μ and standard deviation 3.
Satu pembolehubah rawak selanjar X mempunyai taburan normal dengan min μ *dan sisihan piawai* 3.

Find / *Cari*

(a) the value of μ if the z–score is 0.95 when $x = 68$.
nilai μ *jika skor–z ialah* 0.95 *apabila* $x = 68$.

(b) the value of k if $P(x > k) = 0.7580$.
nilai k jika $P(x > k) = 0.7580$.

[4 *marks* / *markah*]

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

(b) .....

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

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	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											Minus / *Tolak*								
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

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 space provided in the question paper.
Tulis jawapan anda dalam ruang yang disediakan dalam kertas soalan.

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 baru.

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 and 3.
Satu senarai rumus disediakan di halaman 2 dan 3.

9. A normal distribution table is provided on page 16.
Satu sifir taburan normal disediakan.

10. You may use a non-programmable scientific calculator.
Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

11. Hand in this question paper to the invigilator at the end of the examination.
Serahkan kertas soalan ini kepada pengawas peperiksaan di akhir peperiksaan.

SULIT
3472/2
Additional
Mathematics
Paper 2
Ogos
2010

$2\frac{1}{2}$ Jam

PEPERIKSAAN PERCUBAAN BERSAMA SIJIL PELAJARAN MALAYSIA 2010

ANJURAN
PERSIDANGAN KEBANGSAAN PENGETUA-PENGETUA
SEKOLAH MENENGAH CAWANGAN NEGERI PERLIS

ADDITIONAL MATHEMATICS

Paper 2
Kertas 2

Two and a half hours
Dua jam tiga puluh minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini adalah dalam dwibahasa..*

2.. *Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.*

3. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

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 $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

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

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

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

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

6 $\log_a \dfrac{m}{n} = \log_a m - \log_a n$

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

8 $\log_a b = \dfrac{\log_c b}{\log_c a}$

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

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

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

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

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

CALCULUS

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

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

3 $\dfrac{dy}{dx} = \dfrac{dy}{du} \times \dfrac{du}{dx}$

4 Area under a curve

Luas di bawah lengkung

$= \int_a^b y\,dx$ or (atau)

$= \int_a^b x\,dy$

5 Volume generated/*Isipadu janaan*

$= \int_a^b \pi y^2\,dx$ or (atau)

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

GEOMETRY

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

2 Midpoint/*Titik tengah*

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

3 A point dividing a segment of a line/*Titik yang Membahagi suatu tembereng garis*

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

4 Area of triangle/ *Luas segitiga*

$= \dfrac{1}{2}\left|(x_1y_2 + x_2y_3 + x_3y_1) - (x_2y_1 + x_3y_2 + x_1y_3)\right|$

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

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

STATISTICS/*STATISTIK*

1 $\bar{x} = \dfrac{\sum x}{N}$

2 $\bar{x} = \dfrac{\sum fx}{\sum f}$

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

$= \sqrt{\dfrac{\sum x^2}{N} - \bar{x}^2}$

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

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

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

7 $\bar{I} = \dfrac{\sum W_i I_i}{\sum W_i}$

8. ${}^nP_r = \dfrac{n!}{(n-r)!}$

9. ${}^nC_r = \dfrac{n!}{(n-r)!r!}$

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

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

12 Mean/ *Min*, $\mu = np$

13 $\sigma = \sqrt{npq}$

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

TRIGONOMETRY/ *TRIGONOMETRI*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

14 Area of triangle/ *Luas segitiga*

Section A/ Bahagian A
[40 marks/ *markah*]

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

1. Solve the simultaneous equation $x - 3y = 3$ and $x + 6y^2 = 10$.
Give your answer correct to three decimal places.

Selesaikan persamaan serentak $x - 3y = 3$ *dan* $x + 6y^2 = 10$.
Beri jawapan anda betul kepada tiga tempat perpuluhan.

[5 marks/*markah*]

2. A straight line with gradient k passes through the point (4,5). It meets the x-axis and the y-axis at P and Q respectively.
Satu garis lurus yang mempunyai kecerunan k *melalui titik (4,5). Garis itu bersilang pada paksi-x di titik P dan paksi-y di titik Q.*

(a) Find the equation of the straight line PQ in terms of k.
Cari persamaan garis lulus PQ dalam sebutan k.

[1 *marks/markah*]

(b) Given that the area of the triangle OPQ is $20 - \frac{25}{2k} - 8k$, find the value of k when the area of the triangle OPQ is minimum.
Diberi bahawa luas segi tiga OPQ ialah $20 - \frac{25}{2k} - 8k$, *cari nilai k apabila luas segitiga OPQ adalah minimum.*

[6 marks/*markah*]

3. Aini and Emir start working on the same day. Aini earns RM 4 on the first day. Her earning increases constantly by RM x for every subsequent day. She earns RM 40 on her 25th day of working.
Emir earns a fixed salary of RM 30 per day.

Aini dan Emir mula bekerja pada hari yang sama. Aini mendapat gaji RM 4 *pada hari pertama. Pendapatannya pada setiap hari yang berturutan yang berikutnya bertambah* RM x. *Pendapatannya pada hari yang ke 25 adalah* RM 40.
Emir mendapat pendapatan tetap RM 30 sehari.

Find */Cari*
(a) the value of x,
nilai x,
(b) the sum of Aini's earning after 25 days of working,
jumlah pendapatan Aini selepas 25 *hari bekerja,*
(c) the number of days working such that Aini's total earning is more than Emir's total earning.
bilangan hari bekerja yang mana jumlah pendapatan Aini melebihi jumlah pendapatan Emir.

[8 *marks/ markah*]

4. (a) Prove $\frac{\tan\theta}{1+\tan^2\theta} = \cos\theta\sin\theta$

Buktikan $\frac{\tan\theta}{1+\tan^2\theta} = \cos\theta\sin\theta$

[2 *marks/markah*]

(b) (i) Sketch the graph of $y = 2\cos\frac{3}{2}x$ for $0 \le x \le 2\pi$.

Lakar graf bagi $y = 2\cos\frac{3}{2}x$ bagi $0 \le x \le 2\pi$.

(ii) Hence, using the same axes, draw a suitable graph to find the number of solutions to the equation $\cos\frac{3}{2}x = \frac{x}{\pi} - 1$ for $0 \le x \le 2\pi$.

State the number of solutions.

Seterusnya, dengan menggunakan paksi yang sama, lakar satu graf lain yang sesuai untuk mencari bilangan penyelesaian bagi persamaan $\cos\frac{3}{2}x = \frac{x}{\pi} - 1$ untuk $0 \le x \le 2\pi$.

Nyatakan bilangan penyelesaian itu.

[6 *marks/ markah*]

5.. Table 5 shows the frequency distribution of the scores obtained by a group of students in a game.

Jadual 5 *menunjukkan taburan kekerapan bagi skor yang diperoleh sekumpulan pelajar dalam suatu permainan.*

Score *Skor*	Number of students *Bilangan pelajar*
10 - 19	35
20 - 29	55
30 - 39	*k*
40 - 49	32
50 - 59	66
60 - 69	54

Table /*Jadual* 5

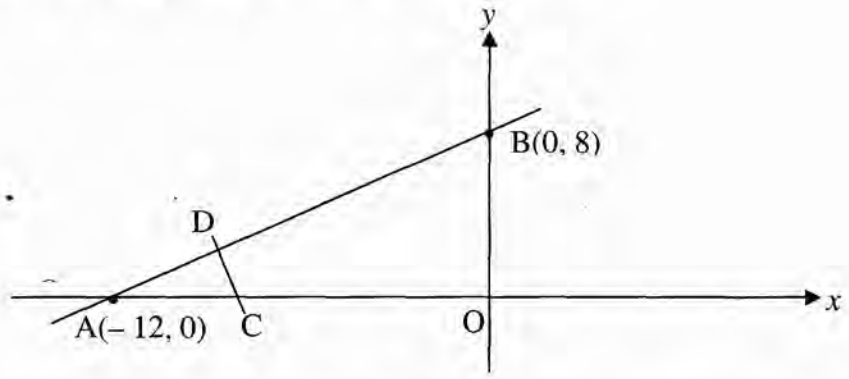
(a) Given the mean score is 41.2, find the value of *k*.
Diberi skor min ialah 41.2, cari nilai bagi k.

[3 marks/ *markah*]

(b) Calculate the standard deviation of the distribution.
Hitung sisihan piawai bagi taburan itu.

[3 marks/*markah*]

6. Diagram 6 shows a straight line *AB* which intersects the straight line *CD* at point *D*. Point *C* lies on the x-axis.
Rajah 6 *menunjukkan garis lurus AB yang bersilang dengan garis lurus CD di titik D. Titik C terletak pada paksi-x.*



Diagram/ *Rajah* 6

a) Write down the equation of *AB*,
Tulis persamaan garis lurus AB,

[1 mark/*markah*]

b) Given that $3AD = DB$, find the coordinates of *D*.
Diberi $3AD = DB$, *cari koordinat-koordinat D.*

[2 marks/*markah*]

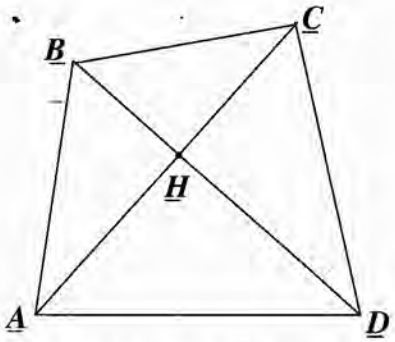
c) Given that *CD* is perpendicular to *AB*, find the coordinates of *C*.
Diberi bahawa CD adalah berserenjang dengan AB, cari koordinat-koordinat C.

[3 marks/ *markah*]

Section /*Bahagian* B
[40 marks/ *markah*]

Answer any **four** questions from this section.
*Jawab mana-mana **empat** soalan daripada bahagian ini.*

7. In diagram 7, *ABCD* is a quadrilateral. The diagonals *BD* and *AC* intersect at point *H*.
Dalam rajah 7, ABCD ialah sebuah sisiempat. Pepenjuru-pepenjuru BD dan AC bersilang di titik H.



Diagram/ *Rajah 7*

It is given that $\overrightarrow{AB} = 6\underline{x}$, $\overrightarrow{AD} = 4\underline{y}$ and $\overrightarrow{BC} = 2\underline{x} + \underline{y}$.
Diberi bahawa, , $\overrightarrow{AB} = 6\underline{x}$, $\overrightarrow{AD} = 4\underline{y}$ *dan* $\overrightarrow{BC} = 2\underline{x} + \underline{y}$.

a) Express in terms of $\underline{x}$ and $\underline{y}$,
Ungkapkan dalam sebutan $\underline{x}$ and $\underline{y}$,

(i) $\overrightarrow{AC}$

(ii) $\overrightarrow{DB}$

[3 *marks/ markah*]

b) Given that $\overrightarrow{AH} = m\overrightarrow{AC}$ and $\overrightarrow{DH} = k\overrightarrow{DB}$,
Diberi $\overrightarrow{AH} = m\overrightarrow{AC}$ *dan* $\overrightarrow{DH} = k\overrightarrow{DB}$

(i) express $\overrightarrow{DH}$ in term of $\underline{x}$, $\underline{y}$ and *k*,

nyatakan $\overrightarrow{DH}$ *dalam sebutan* $\underline{x}$, $\underline{y}$ *dan k,*

(ii) find values of *k* and of *m*.
cari nilai k dan nilai m.

[7 *marks/ markah*]

8. Table 8 shows the values of two variable, *x* and *y*, obtained from an experiment. Variables *x* and *y* are related by the equation $y = pq^{-x}$, where *p* and *q* are constants.

Jadual menunjukkan nilai-nilai dua pembolehubah, x dan y, yang diperoleh daripada satu ujikaji. Pembolehubah x dan y dihubungkan oleh persamaan $y = pq^{-x}$ *dengan keadaan p dan q adalah pemalar.*

x	0.1	0.2	0.3	0.4	0.5	0.6
y	1.32	2.00	3.15	5.00	7.30	11.50

Table/*Jadual* 8

a) Based on table 8, construct a table for the values of $\log_{10} y$.
Berdasarkan jadual 8 *, bina satu jadual bagi nilai-nilai* $\log_{10} y$.

[1 mark/ *markah*]

b) Plot $\log_{10} y$ against *x* using a scale of 2 cm to 0.1 unit on the *x*-axis and 2 cm to 0.2 unit on the $\log_{10} y$ -axis.
Hence, draw the line of best fit.
Plot $\log_{10} y$ *melawan x, dengan menggunakan skala 2 cm kepada 0.1 unit pada paksi-x dan 2 cm kepada 0.2 unit pada paksi-*$\log_{10} y$.
Seterusnya, lukis garis lurus penyuaian terbaik.

[3 marks/*markah*]

c) Use the graph in (b) to find the value of
Gunakan graf di (b) untuk mencari nilai

i) *p*
ii) *q*
iii) *y* when *x* = 0.45

[6 marks/*markah*]

9. Diagram 9 shows a semicircle with centre *O* and radius 9 cm. *RAQ* is a sector of a circle with centre *A* and ΔASO is an equilateral triangle.

Rajah 9 menunjukkan satu semi bulatan berpusat O dan berjejari 9 cm. RAQ adalah sektor bagi sebuah bulatan berpusat A dan ΔASO adalah segitiga sama sisi.

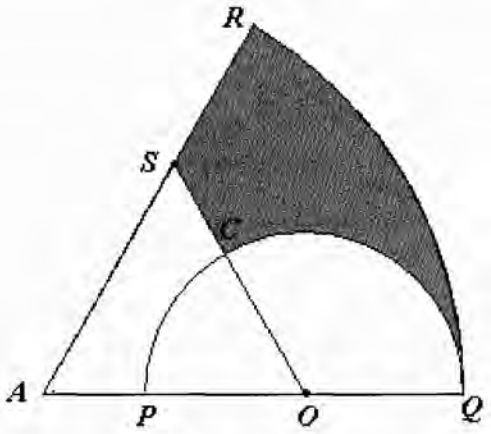


Diagram 9

It is given that $AP : AO = 1 : 4$.
Diberi bahawa $AP : AO = 1 : 4$.
[Use/*guna* $\pi = 3.142$]

Find/ *Cari*

(a) length, in cm, of *AR*,
Panjang, dalam cm, AR

[1 marks/*markah*]

(b) $\angle SOQ$ in radians,
$\angle SOQ$ *dalam radian,*

[2 marks/*markah*]

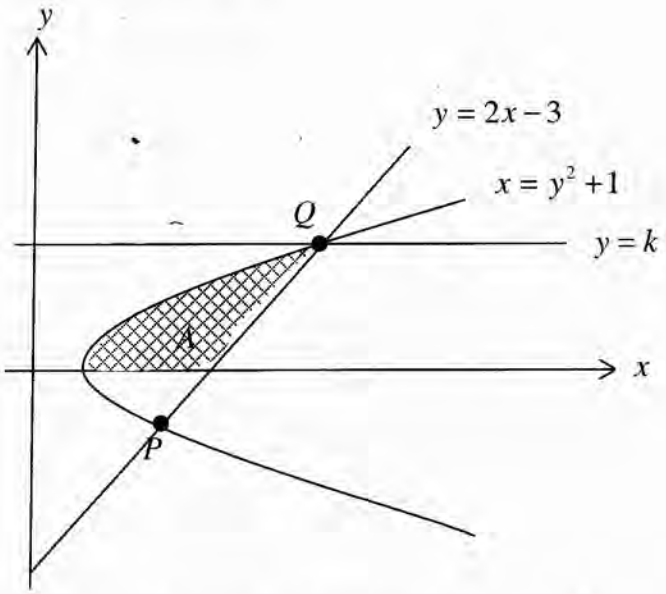
(c) the perimeter, in cm, of the shaded region,
Perimeter, dalam cm, bagi kawasan berlorek,

[3 marks/*markah*]

(d) the area, in cm^2, of the shaded region.
Luas, dalam cm^2, *kawasan berlorek.*

[4 marks/*markah*]

10. Diagram 10 shows the straight line $y = 2x - 3$ intersecting the curve $x = y^2 + 1$ at the points *P* and *Q*.
Rajah 10 *menunjukkan garis lulus* $y = 2x - 3$ *bersilang dengan lengkungan* $x = y^2 + 1$ *pada titik P and titik Q.*



Diagram/ *Rajah* 10

Find/ *Cari*

(a) the coordinates of point *Q*,
koordinat-koordinat bagi titik Q,

[3 marks/*markah*]

(b) the area of the shaded region *A*
luas kawasan berlorek A

[4 marks/*markah*]

(c) the volume generated, in terms of π ,when the area bounded by the curve $x = y^2 + 1$, the y-axis, the x-axis and the line $y = k$ is revolved 360^0 about the *y*- axis.

isipadu kisaran, dalam sebutan π , *apabila rantau yang dilingkungi oleh lengkung* $x = y^2 + 1$, *paksi-y, paksi-x dan garis* $y = k$ *diputar melalui* 360^0 *pada paksi-y*

[3 marks/*markah*]

11. (a) A target shooter is found to have a 75 % success rate in shooting a target.
Seorang penembak didapati mempunyai 75% kejayaan menembak mengenai sasaran.
If 10 shots are chosen at random, calculate the probability that
Jika sepuluh tembakan dipilih secara rawak, hitungkan kebarangkalian bahawa
(i) 10 shots hit the target,
10 tembakan mengenai sasaran,
(ii) at least 9 shots hit the target.
Sekurang-kurangnya 9 tembakan mengenai sasaran.

[5 *marks/markah*]

(b) The heights of male students in SMK Tasoh follows a normal distribution with a mean of 174 cm and a standard deviation of 8 cm
Tinggi pelajar-pelajar lelaki SMK Tasoh adalah mengikut taburan normal dengan min 174 cm *dan sisihan piawai* 8 cm.
Find the probability that a male student chosen randomly from the school has a height of
Cari kebarangkalian seorang pelajar lelaki yang dipilih secara rawak dari sekolah itu, mempunyai tinggi
(i) at least 170 cm,
sekurang-kurangnya 170 cm,
(ii) between 160 cm and 180 cm tall.
di antara 160 cm *dan* 180 cm.

[5 marks/*markah*]

Section C/*Bahagian C*
[20 marks/*markah*]

Answer ***two*** *questions from this section.*
Jawab ***dua*** *soalan daripada bahagian ini.*

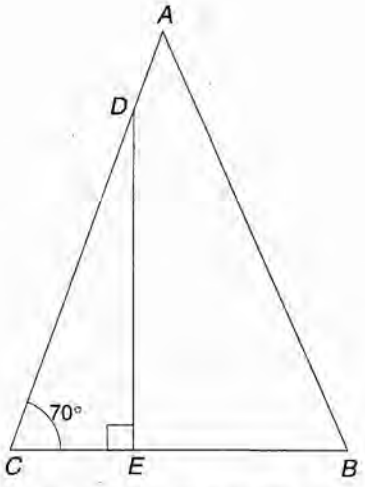
12. A particle moves along a straight line and starts from a fixed point O. Its velocity, $V\ ms^{-1}$, is given by $V = 3t^2 - 18t + 15$, where t is the time, in seconds, after passing through O.
Suatu zarah bergerak di sepanjang suatu garis dan bermula dari suatu titik tetap O. Halajunya, $V\ ms^{-1}$, *diberi oleh* $V = 3t^2 - 18t + 15$, *dengan keadaan t ialah masa, dalam saat, selepas melalui O.*
[Assume motion to the right is positive]
[*Anggapkan gerakan ke arah kanan sebagai positif*]
Find/ *Cari*
(a) the initial velocity, in $m\ s^{-1}$,
halaju awal, dalam $m\ s^{-1}$, [1 marks/*markah*
(b) the time, in seconds, when the particle stops instantaneously,
masa, dalam saat, apabila zarah itu berhenti seketika, [3 marks/*markah*]]
(c) the acceleration, in $m\ s^{-2}$, of the particle at the instant $t = 4$ s,
Pecutan, dalam $m\ s^{-2}$, *zarah itu pada ketika* $t = 4$ s, [2 marks/*markah*]
(d) Sketch the velocity-time graph of the motion of the particle for $0 \le t \le 6$.
Lakar graf halaju melawan masa bagi pergerakan zarah itu untuk $0 \le t \le 6$.

[2 marks/*markah*]

(e) Calculate the total distance travelled in the first 5 seconds after leaving *O*.
Hitung jumlah jarak yang dilalui dalam 5 saat yang pertama selepas melalui O

[2 marks/ *markah*]

13. In Diagram 12, *ADB* and *BEC* are straight lines. Given *AC*=12 cm, *BC*= 9 cm and *AD:DC*=1:5.
Dalam Rajah 12, ADB dan BEC ialah garis lurus. Diberi AC = 12 cm, BC = 9 cm dan AD:DC=1:5.



Diagram/ *Rajah* 12

Calculate/ *Hitung*

(a) the lengths, in cm, of
panjang, dalam cm, bagi
(i) *DC*
(ii) *CE*

[3 marks/*markah*]

(b) $\angle ABC$

[3 marks/*markah*]

(c) the area, in cm², of quadrilateral *ABED*.
luas, dalam cm², sisi empat ABED.

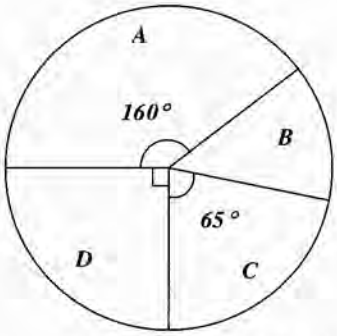
[4 marks/*markah*]

14. Table 13 shows the price and the price indices of four raw materials A, B, C and D, needed to produce a type of paint. Diagram 13 is a pie chart shows the relative amount of materials, A, B, C and D used in the production of the paint.

Jadual 13 *menunjukkan harga dan indeks harga bagi empat jenis bahan yang diperlukan untuk menghasilkan sejenis cat. Rajah* 13 *ialah carta pai yang menunjukkan kuantiti relatif bahan, A, B, C dan D yang digunakan unuk menghasilkan cat tersebut.*

Material	Unit Price		Price Index for the year 2009 based on the year 2008
	Year 2008	Year 2009	
A	1.40	1.54	x
B	4.50	5.40	120
C	2.00	y	115
D	z	6.18	103

Table/ *Jadual* 13



Diagram/ *Rajah* 13

(a) Find the value of x, y, and z.
Cari nilai x, y dan z.

[3 marks/*markah*]

(b) (i) Calculate the composite index for the cost of production of the paint in the year 2009 based on the year 2008.
Hitung nombor indeks gubahan bagi kos menghasilkan cat pada tahun 2009 berasaskan tahun 2008

(ii) Hence, calculate the corresponding cost of producing the paint for the year 2009 if its cost in the year 2008 is RM 110.
Seterusnya, hitung kos menghasilkan cat itu yang sepadan bagi tahun 2009 jika kosnya pada tahun 2008 ialam RM 110.

[4 marks/*markah*]

(c) The composite index for the cost of the production of the paint decreases by 20% from the year 2009 to 2010.
Calculate the composite index for the cost of production of the paint in the year 2010 based on the year 2008.

Nombor indeks gubahan untuk menghasilkan cat menurun 20% *dari tahun 2009 ke tahun 2010.*
Hitung nombor indeks gubahan kos menghasilkan cat itu pada tahun 2010 *berasaskan tahun* 2008.

[3 marks/*markah*]

15. Anis Cake House produces x units of cheese cake and y units of an ice cream cake in a week. The production of the cakes is based on the following constraints.
Kedai Kek Anis menghasilkan x biji kek keju dan y biji kek aiskrim dalam satu minggu. Penghasilan kek-kek ini adalah berdasarkan kekangan berikut.

I. The maximum number of cakes produced is 80.
Bilangan maksimum bagi kek yang dihasilkan ialah 80.

II. The number of cheese cake produced is less than twice the number of ice cream cake produced.
Bilangan kek keju yang dihasilkan adalah kurang daripada dua kali bilangan kek aiskrim

III. The number of ice cream cake must exceed the number of cheese cake by at most 20.
Bilangan kek aiskrim melebihi bilangan kek keju selebih-lebihnya sebanyak 20.

(a) Write down three inequalities other than $x \geq 0$ and $y \geq 0$ which satisfies all the above constraint.
Tuliskan tiga ketaksamaan selain daripada $x \geq 0$ dan $y \geq 0$ yang memenuhi semua kekangan di atas.

[3 marks/ *markah*]

(b) By using a scale of 2 cm to 10 cakes on both axes, construct and shade the region R that satisfies all the above constraints.
Dengan menggunakan skala 2 cm kepada 10 biji kek untuk kedua-dua paksi, bina dan lorekkan rantau R yang memenuhi semua kekangan di atas.

[3 marks/ *markah*]

(c) Based on your graph in (b), find
Berpandukan graph dalam (b) cari

(i) the range of the number of cheese cake if the number of ice cream cake is 130.
Julat bilangan kek keju jika bilangan kek aiskrim ialah 30 biji.

[1 mark/ *markah*]

(ii) The maximum profit per week for Anis Cake House if the price for cheese cake and ice cream cake is RM 30 and RM 40 respectively.
Keuntungan maksimum seminggu untuk Kedai Kek Anis jika harga bagi kek keju dan kek aiskrim masing-masing ialah RM 30 dan RM 40.

[3 marks/*markah*]

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

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	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											Minus / *Tolak*								
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

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of three sections: **Section A**, **Section B** and **Section C.**

   Kertas soalan ini mengandungi tiga Bahagian: ***Bahagian A***, ***Bahagian B*** dan ***Bahagian C.***

2. Answer all questions in **Section A**, four questions in **Section B** and two questions in **Section C.**

   Jawab ***semua*** *soalan dalam* ***Bahagian A***, ***empat*** *soalan dalam* ***Bahagian B*** *dan* ***dua*** *soalan dalam* ***bahagian C.***

3. Write your answer on the "buku jawapan" provided. If the "buku jawapan" is insufficient, you may ask for "helaian tambahan" from the invigilator.

   Jawapan anda hendaklah ditulis dalam buku jawapan yang disediakan. Sekiranya buku jawapan tidak mencukupi, sila dapatkan helaian tambahan daripada pengawas 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 The diagrams in the questions provided are not drawn to scale unless stated.

   Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

6. The marks allocated for each question and sub-part of a question are shown in brackets.

   Markah yang diperuntukkan bagi setiap soalan dan ceraian soalan ditunjukkan dalam kurungan.

7. A list of formulae is provided on page 2 and 3.
   Satu senarai rumus disediakan di halaman 2 dan 3.

8. Graph papers and the normal distribution table are provided.
   Kertas graf dan sifir taburan normal disediakan.

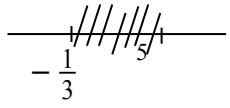
9. You may use a non-programmable scientific calculator.
   Anda dibenarkan menggunakan kalkulator saintifik yang tidak boleh diprogram.

10. Tie the "helaian tambahan" and graph papers together with the "buku jawapan" and hand in to the invigilator at the end of the examination.

    Ikat helaian tambahan dan kertas graf bersama-sama dengan buku jawapan dan serahkan kepada pengawas peperiksaan anda pada akhir peperiksaan.

ADD MATHEMATICS PAPER 1,2010

Mark Scheme

No	Answers	Sub-marks	Total mark
1	a) 5 b) 3	1 1	2
2	-2 B1: $f(x)=\frac{x-5}{3}$	3	3
3	a) $3kx+8$ a) $\frac{5}{12}$ B1: $3k=\frac{5}{4}$	1 2	3
4	2.766 and – 1.266 B2: $\frac{(-3)\pm\sqrt{(-3)^2-4(2)(-}}{2(2)}$ B1: $2x^2-3x-7=0$	3	3
5	a) $(x-4)^2-5$ b) 11 B1: $(0-4)^2-5$	1 2	3
6	$-\frac{1}{3}\le x\le 5$ B2:  B1: $(3x+4)(x-5)<0$ Or roots $-\frac{1}{3}$ and 5	3	3
7	– 3 B2: $3x+1=2(x-1)$ B1: 5^{3x+1} or $(5^{4(x-1)})^{\frac{1}{2}}$	3	3
8	$\frac{5}{2}-\frac{m}{2}-n$ B3: $\frac{5\log 2-\log p-2\log q}{2}$ B2: change base and 1 law of log B1: use 1 law of log	4	4
9	27 B2: $x=9^{\frac{3}{2}}$	3	
	B1: $x^{\frac{2}{3}}$ seen		3

No	Answers	Sub-mark	Total mark
10	a) $\frac{2}{3}$ B1: $ar=\frac{1}{18}$ or $ar^5=\frac{8}{729}$ b) $\frac{1}{4}$ or 0.25 B1: $a=\frac{1}{12}$	2 2	4
11	a) 15 b) 217 B2: $\frac{7}{2}[2(19)+(7-1)(4)]$ or $\frac{13}{2}[2(-5)+12(4)]-\frac{6}{2}[2(-5$ B1: $T_7=19$ or $\frac{13}{2}[2(-5)+12(4)]$ or $\frac{6}{2}[2(-5)+5(4)]$	1 3	4
12	$y=2x^2-4x$ B2: $\frac{y}{x}=2x-4$ B1: $m=2$	3	3
13	$-\frac{3}{2}$ or – 1.5 B2: $-\frac{5}{4p}\times-\frac{6}{5}=-1$ B1: $-\frac{5}{4p}$ or $-\frac{6}{5}$ seen	3	3
14	a) $-4\underline{i}+3\underline{j}$ or $\begin{pmatrix}-4\\3\end{pmatrix}$ B1: $\overrightarrow{AB}=\overrightarrow{AO}+\overrightarrow{OB}$ b) 5	2 1	3
15	$\frac{10}{3}$ B3: $10k=3m$ B2: $m=2\lambda$ and $5k=3\lambda$	4	

	B1: $\overrightarrow{PQ} = \lambda\overrightarrow{RS}$ seen		4
16	a) $\frac{1}{k}$ b) $-\sqrt{1-k^2}$ B1: $\cos\pi\cos x - \sin\pi\sin x$	1 2	3

No	Answers	Sub-mark	Total mark
17	a) 0.3948 B1: $\cos\angle POR = \frac{12}{13}$ b) 11.13 B1: 13×0.3948	2 2	4
18	$y = \frac{2}{3}x^3 - 5x - 2$ B2: $1 = \frac{2}{3}(3)^3 - 5(3) + c$ B1: $\frac{2}{3}x^3 - 5x$	3	3
19	$24x - 16$ B1: -6 or -2 seen	2	2
20	$\frac{1}{3}$ B2: $12x - 4 = 0$ B1: $12x - 4$	3	3
21	4 B2: $4k - 2k = 8$ B1: 5 seen	3	3
22	8 B2: $2(k^2 - 7k - 8) = 0$ or $2(k^2 - 7k - 8$ B!: $\frac{29+k^2}{3} - \left(\frac{7+k}{3}\right)^2$	3	3
23	a) $\frac{3}{7}$ B1: $\frac{1}{3}$ *or* $\frac{2}{7}$ seen	2	
	b) $\frac{2}{21}$ B1: $\frac{1}{3}\times\frac{2}{7}$	2	4
24	a) 3 B1: $p = 0.05$ b) 2.85 B1: $60\times 0.05\times 0.95$	2 2	4
25	a) 65.15 B1: $\frac{68-\mu}{3} = 0.95$ b) -0.7 B1: 0.242	2 2	4

ANSWER TRIAL PAPER 2, 2010
SECTION A

1. $x = 3 + 3y$ *or* $y = \dfrac{x-3}{3}$ 1M

Substitute x or y into eqn. 2. 1M

$3 + 3y + 6y^2 = 10$ or

$x + 6\left(\dfrac{x-3}{3}\right)^2 = 10$ or

equivalent.

$6y^2 + 3y - 7 = 0$ or

$2x^2 - 27x - 12 = 0$

$y = \dfrac{-3 \pm \sqrt{3^2 - 4(6)(-7)}}{2(6)}$ 1M

Or

$x = \dfrac{-(-9) \pm \sqrt{(-9)^2 - 4(2)(-12)}}{2(2)}$

y = 0.859, – 1.359 1M

x = 5.577 // 5.576,
– 1.077 // – 1.076 1M

2. (a) $y = kx - 4k + 5$ 1M

(b) $\dfrac{dA}{dk} = \dfrac{25}{2}k^{-2} - 8$ 1M

$\dfrac{25}{2}k^{-2} - 8 = 0$ 1M

$k = \dfrac{5}{4}, \quad k = -\dfrac{5}{4}$ 1M

$\dfrac{d^2A}{dk^2} = -25k^{-3}$ 1M

A minimum, $k = -\dfrac{5}{4}$ 1M

3. a) $4 + (25 - 1)x = 40$ 1M

$x = 1.50$ 1M

b) $\dfrac{25}{2}[2(4) + (25-1)(1.50)]$ 1M

= 550 1M

c) $\dfrac{n}{2}[2(4) + (n-1)(1.5)]$ 1M

$\dfrac{n}{2}[2(4) + (n-1)(1.5)] > 30n$ 1M

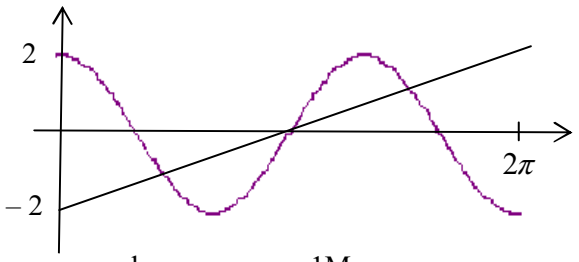
$n > 35.67$ 1M

$N = 36$ 1M

4. (a) $\dfrac{\tan\theta}{\sec\theta}$ 1M

$\dfrac{\sin\theta}{\cos\theta} \times \dfrac{\cos^2\theta}{1}$ 1M

(b) (i)



graph cos 1M,
Max 2 and min – 2 1M

$1\frac{1}{2}$ cycle 1M

(ii) $y = \dfrac{2x}{\pi} - 2$ 1M,

Draw straight line graph 1M
No. of solution = 3 1M

5. (a) $\dfrac{10359 + 34.5k}{242 + k}$ 1M

$\dfrac{10359 + 34.5k}{242 + k} = 41.2$ 1M

$k = 58$ 1M

(b) $\sum fx^2 = 593465$ 1M

$\sqrt{\dfrac{593465}{300} - (41.2)^2}$ 1M

= 16.76 1M

6. (a) $\dfrac{y}{8} - \dfrac{x}{12} = 1$ or $y = \dfrac{2}{3}x + 8$ or
equivalent 1M

(b) $\left(\dfrac{3(-12)+1(0)}{1+3}, \dfrac{3(0)+1(8)}{1+3}\right)$

Either x or y correct 1M
(– 9, 2) 1M

c) Equation CD or gradient CD 1M

$y - 2 = -\dfrac{3}{2}(x - (-9))$ or

$mCD = \dfrac{2-0}{-9-x}$

Find x, when $y = 0$ or $\dfrac{2-0}{-9-x} = -\dfrac{3}{2}$

and solve for x 1M

$C\left(-\dfrac{23}{3}, 0\right)$ 1M

Section B

7. a) $\overrightarrow{AC} = \overrightarrow{AB} + \overrightarrow{BC}$ or $\overrightarrow{DB} = \overrightarrow{DA} + \overrightarrow{AB}$ 1M

$\overrightarrow{AC} = 8\underline{x} + \underline{y}$ 1M

$\overrightarrow{DB} = 6\underline{x} - 4\underline{y}$ 1M

b) (i) $\overrightarrow{DH} = k(6\underline{x} - 4\underline{y})$ 1M

(ii) $\overrightarrow{DH} = -4\underline{y} + m(8\underline{x} + \underline{y})$ 1M

$-4\underline{y} + m(8\underline{x} + \underline{y}) = k(6\underline{x} - 4\underline{y})$ 1M

$-4 + m = -4k$ and

$8m = 6k$ 1M

Solve equations 1M

$k = \frac{16}{19}$ 1M, $m = \frac{12}{19}$ 1M

8. a)

$\log_{10} y$	0.1206	0.301	0.4983	0.699	0.8633	1.061

1M

b) $\log_{10} y = \log_{10} p - x \log_{10} q$ 1M

All points plotted 2M

Line of best fit 1M

c) (i) $\log_{10} p = \log_{10} y$ – int *ercept* 1M

$p =$ 0.832 – 0.871 1M

(ii) $-\log_{10} q =$ *gradient* 1M

$q =$ 0.013 1M

(iii) $y =$ 6.03 1M

9. a) AR = 12 + 9 = 21 1M

b) $\angle SOQ = 120^o$ 1M

= 2.095 rad 1M

c) arc RQ = $21 \times \frac{60}{180} \times \pi$ or

arc CQ = 9×2.095 1M

perimeter = $9 \times 2.095 + 21 \times \frac{60}{180} \times \pi + 9 + 3$ 1M

= 52.85 1M

d) Area of sector 1M

Area of triangle 1M

Area of shaded region =

$\frac{1}{2}(21)^2 \times 1.047 - \frac{1}{2}(9)^2 \times 2.095 - \frac{1}{2}(12)(\sqrt{12^2 - 6^2}$

1M

= 83.66 1M

10. a) Solve equations

$y = 2x - 3$ *and* $x = y^2 + 1$ 1M

$y = -\frac{1}{2}$, $y = 1$ or

$x = \frac{5}{4}$, $x = 2$ 1M

Q (2, 1) 1M

Area of trapezium = $\frac{1}{2}\left(2 + \frac{3}{2}\right)(1)$ 1M

$\int_0^1 (y^2 + 1)dy = \frac{y}{3} + y$ 1M

Area = $\frac{7}{4} - \left[\left(\frac{1}{3} + 1\right) - 0\right]$ 1M

= $\frac{5}{12}$ // 0.417 1M

(c) $V = \pi \int_0^1 \left(y^2 + 1\right)^2 dx$

$= \pi \left[\frac{y^5}{5} + \frac{2y^3}{3} + y\right]_0^1 dx$ 1M

$= \pi \left[\frac{1^5}{5} + \frac{2(1)^3}{3} + 1\right] - 0$ 1M

$= \frac{28}{15}\pi$ // 1.867π 1M

11. (a)

$p = 0.75$ and $q = 0.25$ 1M

Use ${}^{10}C_n \times 0.75^n \times 0.25^{10-n}$ 1M

(i) P(X = 10) = 0.05631 1M

(ii) P(X = 9) + P (X = 10) 1M

= 0.244 1M

b) $z = \frac{x - 174}{8}$ 1M

(i) 0.6915 1M

(ii) $P(-1.75 \le z \le 0.75)$ 1M

Finding correct area 1M

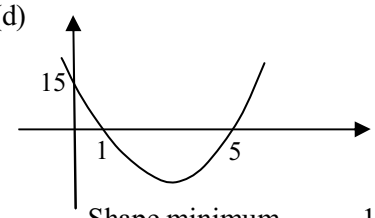
0.7333 1M

12. (a) $t = 0, v = 15$ 1M

(b) $3t^2 - 18t + 15 = 0$ and solve 1M
$t = 1, \quad t = 5$ 2M

(c) $a = 6t - 18$ 1M
$= 6$ 1M

(d)



Shape minimum 1M
3 coordinates shown 1M

(e) Distance $= \left[t^3 - 9t + 15t\right]_0$ 1M
$= 425$ 1M

$P_{07} = \text{RM}240$

13. (a) (i) $CD = 10$ 1M

(ii) $\frac{CE}{10} = \cos 70^o$ 1M
$CE = 3.42$ 1M

(b) $AB^2 = 12^2 + 9^2 - 2(12)(9)\cos 70^o$ 1M
$AB = 12.29$ 1M

$\frac{\sin \angle ABC}{12} = \frac{\sin 70^o}{12.29}$ 1M

$\sin \angle ABC = 0.9175$

$\angle ABC = 66.56^o \ // \ 66.57^o$ 1M

c) Area $= \frac{1}{2}(12)(9)\sin 70$ or

Area $= \frac{1}{2}(10)(3.42)\sin 70$ 1M

Area $ABED = \frac{1}{2}(12)(9)\sin 70 - \frac{1}{2}(10)(3.42)\sin 70$
1M
$= 34.67$ 1M

14. (a) $x = \frac{1.54}{1.4} \times 100 = 110$ 1M

$\frac{y}{2} \times 100 = 115$, $y = 2.30$ 1M

$\frac{6.18}{z} \times 100 = 103$, $z = 6$ 1M

(b) (i)
$\frac{110(160) + 120(45) + 115(65) + 103(90)}{360}$ 1M

$\bar{I} = 110.4$ 1M

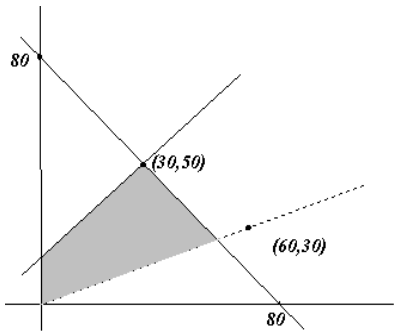
(ii) $\frac{P_{09}}{110} \times 100 = 110.4$ 1M
$P_{09} = 121.44$

(c) $P_{10/09} = 80$ 1M

$\frac{P_{10/09} \times P_{09/08}}{100} = \frac{80 \times 110.4}{100}$ 1M
$= 88.32$ 1M

15. (a) I : $x + y \le 80$ 1M
II : $x < 2y$ 1M
III : $y \le x + 20$ 1M

(b)



One straight line drawn 1M
The other two straight lines drawn 1M
Region R 1M

(b) (i) $10 \le x \le 50$ 1M
(ii) $p = 30x + 40y$
Finding maximum point (30, 50) 1M

Maximum profit = 30 (30) + 40 (50) 1M
= 2900 1M