Nama:……..……..

Tingkatan: ……..……..

3472/1
Matematik Tambahan
Kertas 1
September 2011
2 Jam

MAJLIS PENGETUA SEKOLAH-SEKOLAH MALAYSIA (MPSM)
CAWANGAN KELANTAN

PEPERIKSAAN PERCUBAAN SPM
TINGKATAN LIMA
2011

MATEMATIK TAMBAHAN
KERTAS 1
Masa : Dua Jam

JANGAN BUKA BUKU SOALAN INI SEHINGGA DIBERITAHU

Arahan:

1. *Tuliskan **nama** dan **tingkatan** anda pada ruangan yang disediakan.*
2. *Kertas soalan in adalah dalam dwi bahasa.*
3. *Soalan dalam bahasa Inggeris mendahului soalan yang sepadan dalam bahasa Malaysia.*
4. *Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam bahasa Inggeris atau bahasa Malaysia.*
5. *Calon dikehendaki membaca maklumat di halaman belakang kertas soalan ini.*

Soalan	Markah Penuh	Markah Diperolehi
1	2	
2	3	
3	3	
4	3	
5	4	
6	3	
7	3	
8	3	
9	3	
10	4	
11	4	
12	3	
13	4	
14	3	
15	2	
16	4	
17	3	
18	3	
19	2	
20	4	
21	4	
22	3	
23	3	
24	3	
25	4	
TOTAL	**80**	

Kertas soalan ini mengandungi 21 halaman bercetak

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

1 Diagram 1 shows the function *f*.
Rajah 1 *menunjukkan fungsi f.*

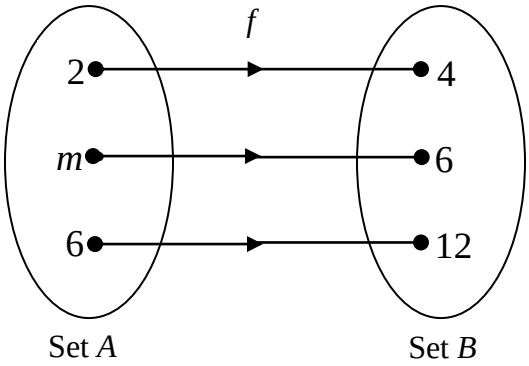


Diagram 1
Rajah 1

(*a*) State the codomain of the function *f*.
Nyatakan kodomain untuk fungsi f.

(*b*) Determine the value of *m*.
Tentukan nilai m.

[2 *marks*]
[2 *markah*]

Answer / *Jawapan* :

(a)

(b)

1

2

2 The following information is about the function g and the composite function g^2.
Maklumat berikut adalah berkaitan dengan fungsi g dan fungsi gubahan g^2.

For Examiner's Use

$$g : x \to 2x + k,$$
$$g^2 : x \to hx - 9,$$

where h and k are constants .

dengan keadaan h dan k ialah pemalar.

Find the value of h and of k. [3 *marks*]
Cari nilai h dan nilai k. [3 *markah*]

Answer / *Jawapan:*

2

---

3 Given the functions $f : x \to 2x + 1$ and $g : x \to 3 - 4x$, find

Diberi fungsi $f : x \to 2x + 1$ *dan* $g : x \to 3 - 4x$, *cari*

(a) $f^{-1}(x)$,

(b) the value of m such that $gf^{-1}(m) = 7 - m$.
nilai m dengan keadaan $gf^{-1}(m) = 7 - m$.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan:*
(a)

(b)

3

For Examiner's Use

4 Given 3 and 2*h* are the roots of the quadratic equation $x^2 - 4x + k = 0$, where *h* and *k* are constants. Find the value of *h* and of *k*.

[3 *marks*]

Diberi 3 *dan* 2*h ialah punca-punca persamaan kuadratik* $x^2 - 4x + k = 0$, *dengan keadaan h dan k adalah pemalar. Cari nilai h dan nilai k.*

[3 *markah*]

Answer / *Jawapan:*

4

3

---

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

Answer / *Jawapan:*

5

4

6 Diagram 6 shows the graph of quadratic function $f(x) = (x - k)^2 + r$, where k and r are constants.
Rajah 6 *menunjukkan graf fungsi kuadratik* $f(x) = (x - k)^2 + r$, *dengan keadaan* k *dan* r *adalah pemalar.*

For Examiner's Use

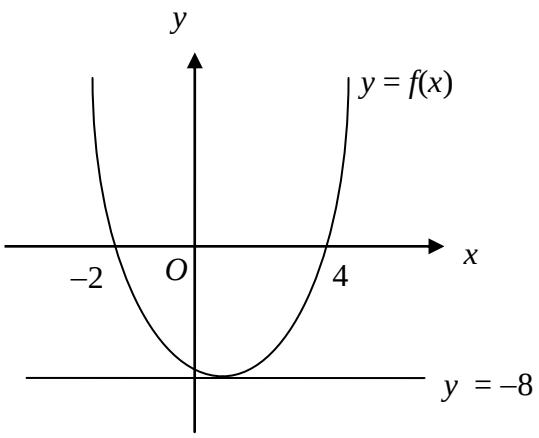


Diagram 6
Rajah 6

State
Nyatakan

(*a*) the value of k,
nilai k,
(*b*) the value of r,
nilai r,
(*c*) the equation of axis of symmetry.
persamaan bagi paksi simetri.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

(*c*)

6

3

For Examiner's Use

7 Solve the equation:
Selesaikan persamaan:

$$2^x\,(8) \;=\; \frac{1}{32^{x-3}}$$

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:

7
3

---

8 Given $\log_m 4 = p$ and $\log_m 3 = t$. Express $\log_m \left(\frac{64}{3m}\right)$ in terms of t and p. [3 *marks*]

Diberi $\log_m 4 = p$ *dan* $\log_m 3 = t$. *Ungkapkan* $\log_m \left(\frac{64}{3m}\right)$ *dalam sebutan t dan p.* [3 *markah*]

Answer / *Jawapan*:

8
3

9 The first three terms of an arithmetic progression are -3, 4, 11. Find the greatest number of terms for the progression that is less than 43. [3 *marks*]

Tiga sebutan pertama bagi janjang aritmetik ialah -3, 4, 11. *Cari bilangan sebutan terbesar janjang ini yang kurang daripada* 43.

[3 *markah*]

Answer / *Jawapan:*

9

3

---

10 The first three terms of an arithmetic progression are $3k,\ k+4,\ 11$.

Tiga sebutan pertama suatu janjang aritmetik ialah $3k,\ k+4,\ 11$.

Find
Cari

(a) the value of *k.*
nilai bagi k.
(b) the sum of the first 8 terms of the progression.
hasil tambah bagi 8 *sebutan pertama bagi janjang itu.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

(b)

10

4

For Examiner's Use

11 In a geometric progression, the first term is 8 and the sixth term is $\frac{1}{4}$.

Dalam suatu janjang geometri, sebutan pertama ialah 8 *dan sebutan keenam ialah* $\frac{1}{4}$.

Find
Cari

(a) the common ratio of the progression,
nisbah sepunya janjang itu,

(b) the sum to infinity of the progression.
hasil tambah hingga ketakterhinggaan janjang itu.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan* :

(*a*)

(*b*)

11

4

For Examiner's Use

12 The variables x and y are related by the equation $y = 100p^x$, where p is a constant. Diagram 12 shows the straight graph obtained by plotting $\log_{10} y$ against x.

Pembolehubah x dan y dihubungkan oleh persamaan $y = 100p^x$, *dengan keadaan p ialah pemalar.*
Rajah 12 *menunjukkan graf garis lurus yang diperoleh dengan memplot* $\log_{10} y$ *melawan x.*

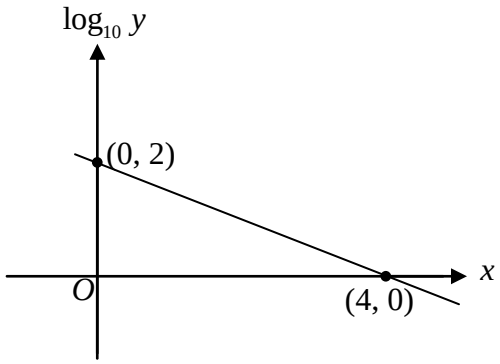


Diagram 12
Rajah 12

(a) Express the equation $y = 100p^x$ in its linear form used to obtain the straight line graph shown in Diagram 12.

Ungkapkan persamaan $y = 100p^x$ *dalam bentuk linear yang digunakan untuk memperoleh graf garis lurus seperti ditunjukkan dalam Rajah* 12.

(b) Find the value of p.
Cari nilai p

[3 *marks*]
[3 *markah*]

Answer / *Jawapan* :

(a)

(b)

12

3

For Examiner's Use

13 Diagram 13 shows a straight line passing through A (0, 4) and C(6, -2).
Diagram 13 *menunjukkan garis lurus yang melalui* A(0, 4) *dan* C(6, -2).

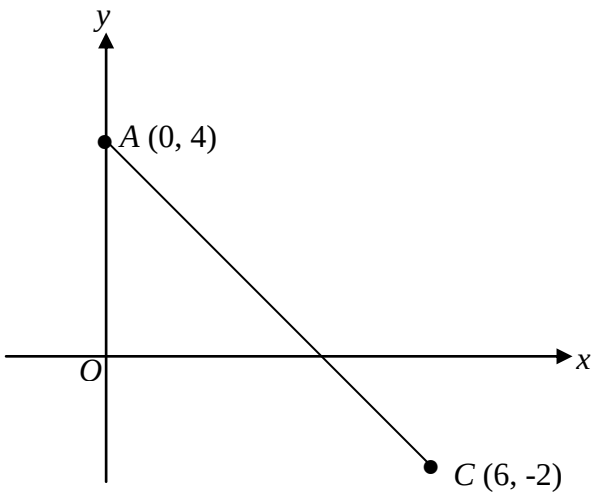


Diagram 13
Rajah 13

(a) A point B is midpoint AC, find the coordinates of B.
Suatu titik B ialah titik tengah AC , cari titik B.

(b) A point $P(x, y)$ moves such that $PB = PC$, find the equation of the locus of P.
Suatu titik P(x, y) bergerak dengan keadaan PB = PC , cari persamaan lokus bagi P.

[4 marks]
[4 *markah*]

Answer / *Jawapan* :
(a)

(b)

13
4

---

14 Given that P(-1, -4), Q (2, k) and R(4, 11) are colinear, find the value of k. [3 marks]
Diberi P(-1, -4), Q(2, k) *dan* R(4, 11) *adalah segaris, cari nilai* k. [3 markah]

Answer / *Jawapan:*

14
3

15 Diagram 15 shows vector $\overrightarrow{OB}$ and vector $\overrightarrow{AB}$.
Rajah 15 *menunjukkan vektor* $\overrightarrow{OB}$ *dan vektor* $\overrightarrow{AB}$.

For Examiner's Use

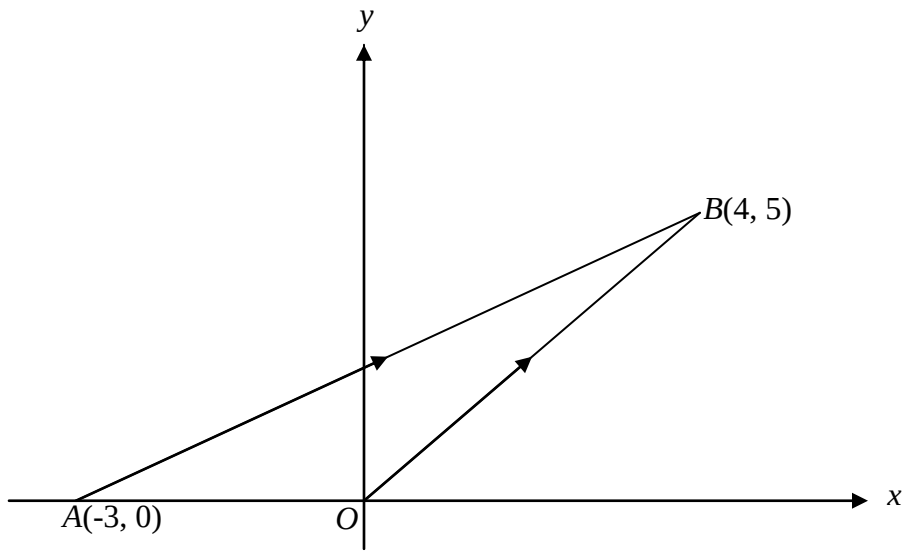


Diagram 15
Rajah 15

Express
Ungkapkan

(a) $\overrightarrow{OB}$ in the form $\begin{pmatrix} x \\ y \end{pmatrix}$.
$\overrightarrow{OB}$ *dalam bentuk* $\begin{pmatrix} x \\ y \end{pmatrix}$.

(b) $\overrightarrow{AB}$ in the form $x\underset{\sim}{i} + y\underset{\sim}{j}$
$\overrightarrow{AB}$ *dalam bentuk* $x\underset{\sim}{i} + y\underset{\sim}{j}$

[2 *marks*]
[2 *markah*]

Answer / *Jawapan:*

(a)

(b)

15

2

For Examiner's Use

16 Given that $\underset{\sim}{a} = 4\underset{\sim}{i} + 6\underset{\sim}{j}$ and $\underset{\sim}{b} = 2\underset{\sim}{i} + p\underset{\sim}{j}$, where *p* is a constant.

Diberi $\underset{\sim}{a} = 4\underset{\sim}{i} + 6\underset{\sim}{j}$ *dan* $\underset{\sim}{b} = 2\underset{\sim}{i} + p\underset{\sim}{j}$ *, dengan keadaan p ialah pemalar.*

(a) Find the value of *p* if $\underset{\sim}{a}$ and $\underset{\sim}{b}$ are parallel.
Cari nilai p jika $\underset{\sim}{a}$ *dan* $\underset{\sim}{b}$ *adalah selari.*

(b) By using the value of *p* in (*a*) , find the value of $|\underset{\sim}{a} - \underset{\sim}{b}|$.
Dengan menggunakan nilai p dalam (a), cari nilai $|\underset{\sim}{a} - \underset{\sim}{b}|$.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

16

4

(b)

---

17 Solve the equation $4\cos^2 x + 4\sin x - 5 = 0$ for $0° \le x \le 360°$. [3 *marks*]
Selesaikan persamaan $4\cos^2 x + 4\sin x - 5 = 0$ *untuk* $0° \le x \le 360°$. [3 *markah*]

Answer / *Jawapan* :

17

3

For Examiner's Use

18 Diagram 18 shows a semicircle with centre *O* and radius 8 cm.
Rajah 18 *menunjukkan sebuah semi bulatan berpusat O dan berjejari* 8 cm.

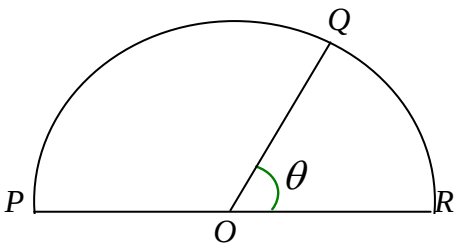


Diagram 18
Rajah 18

Given the length of arc *PQ* is equal to perimeter of minor sector *OQR*.
Diberi panjang lengkok PQ adalah sama dengan perimeter sektor minor OQR.

Find the value of θ, in radians. [3 *marks*]
Cari nilai θ, *dalam radian.* [3 *markah*]
[Use / *Guna* $\pi = 3.142$]

Answer / *Jawapan* :

18

3

19 The curve $y = f(x)$ is such that $\frac{dy}{dx} = 2kx - 9$, where *k* is a constant, has a turning point at x = 3. Find the value of *k*. [2 *marks*]

Suatu lengkung $y = f(x)$ *adalah dengan keadaan* $\frac{dy}{dx} = 2kx - 9$, *dengan keadaan k ialah pemalar, mempunyai titik pusingan pada x* =3. *Cari nilai k.* [2 *markah*]

Answer / *Jawapan* :

19

2

For Examiner's Use

20 Given that $y = x^2 - 3x + 2$,

Diberi $y = x^2 - 3x + 2$,

(a) find the value of $\frac{dy}{dx}$ when $x = 4$,

cari nilai bagi $\frac{dy}{dx}$ *apabila* $x = 4$,

(b) express the approximate change in x, in terms of p, when y changes from 6 to $6 + p$, where p is a small value.

ungkapkan perubahan kecil bagi x, dalam sebutan p, apabila y berubah daripada 6 *kepada* $6 + p$, *dengan keadaan p ialah nilai yang kecil.*

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

(b)

20

4

---

21 Given that $\frac{d}{dx}\left(\frac{x^2}{x-1}\right) = f(x)$, find the value of $\int_0^4 [x - f(x)]dx$. [4 *marks*]

Diberi $\frac{d}{dx}\left(\frac{x^2}{x-1}\right) = f(x)$, *cari nilai* $\int_0^4 [x - f(x)]dx$. [4 *markah*]

Answer / *Jawapan:*

21

4

For Examiner's Use

22 A set of data consists of 2, 3, 6, 6, 7, 8, 9, 12 and 13.
Suatu set data terdiri daripada 2, 3, 6, 6, 7, 8, 9, 12 *dan* 13.

Determine
Tentukan

(a) the range of the data,
julat bagi data itu,

(b) the interquartile range of the data.
julat antara kuartil bagi data itu.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:
(a)

(b)

22
3

---

23 Diagram 23 shows six cards of different letters.
Rajah 23 *menunjukan enam keping kad huruf yang berlainan.*

L	I	N	E	A	R

Diagram 23
Rajah 23

How many
Berapa banyak

(a) the number of possible arrangement, in a row, of all the cards.
bilangan cara susunan yang mungkin, dalam satu baris, semua kad itu.

(b) the number of these arrangements in which a vowel are side by side.
bilangan cara susunan itu dengan keadaan huruf vokal adalah bersebelahan.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:
(a)

(b)

23
3

For Examiner's Use

24 The probability that team *A* qualifies for the final of a tennis game is $\frac{3}{5}$ while the probability that team *B* qualifies is $\frac{1}{4}$.

Kebarangkalian pasukan A layak ke peringkat akhir dalam suatu perlawanan tenis ialah $\frac{3}{5}$ *manakala kebarangkalian pasukan B layak ialah* $\frac{1}{4}$.

Find the probability that
Cari kebarangkalian

(a) both of them qualify for the final,
kedua-dua pasukan layak ke peringkat akhir,

(b) only one of them qualifies for the final.
hanya satu pasukan layak ke peringkat akhir.

[3 *marks*]
[3 *markah*]

Answer / *Jawapan*:
(a)

(b)

24

3

For Examiner's Use

25 Diagram 25 shows a standard normal distribution graph.
Rajah 25 *menunjukkan satu graf taburan normal piawai*

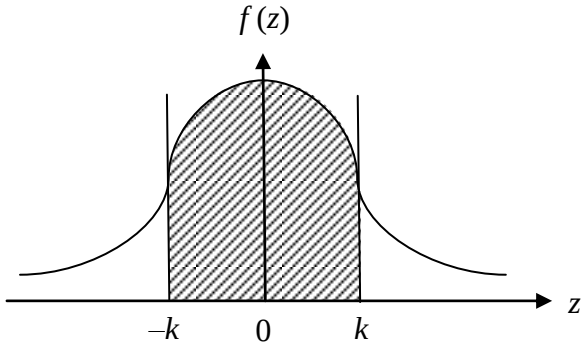


Diagram 25
Rajah 25

The probability represented by the area of the shaded region is 0.5160.
Kebarangkalian yang diwakili oleh luas kawasan berlorek ialah 0.5160.

(a) Find the value of k,
Cari nilai k ,

(b) X is a continuous random variable which is normally distributed with a mean of 30 and a standard deviation of 4.
Find the value of X when the z-score is k.

X ialah pembolehubah rawak selanjar yang bertaburan secara normal dengan min 30 *dan sisihan piawai* 4.
Cari nilai X apabila skor-z ialah k.

[4 *marks*]
[4 *markah*]

Answer / *Jawapan*:

(a)

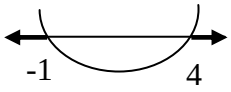
(b)

25

4

END OF QUESTION PAPER
KERTAS SOALAN TAMAT

MPSM KELANTAN
TRIAL SPM 2011
ADDITIONAL MATHEMATICS (PAPER 1)

No.	Solution and mark scheme	Sub marks	Full marks
1 (a)	{4, 6, 12}		2
(b)	3		
2	$h = 4$, $k = -3$ (both) B2 : $h = 4$ *or* $k = -3$ B1 : $2(2x + k) + k$		3
3 (a)	$\frac{x-1}{2}$	1	
	-2	2	3
(b)	B1 : $3 - 4\left(\frac{m-1}{2}\right)$ Note: accept m or x		
4	$h = \frac{1}{2}$, $k = 3$ (*both*) B2: $h = \frac{1}{2}$ *or* k = 3 B1: $3 + 2h = 4$ *or* $6h = k$		3
5	$x < -1$, $x > 4$ B3 :  B2: $(x + 1)(x - 4) > 0$ B1: $x^2 - 3x - 4 > 0$		4
6 (a)	1	1	
(b)	-8	1	3
(c)	$x = 1$	1	
7	$x = 2$ B2 : $x + 3 = -5x + 15$ B1 : 2^{x+3} *or* $2^{-5(x-3)}$		3
8	$3p - t - 1$ B2 : $3\log_m 4 - (\log_m 3 + \log_m m)$ B1 : $\log_m 64 - \log_m 3m$ *or* $\log_m 3 + \log_m m$		3
9	$n = 7$ B2 : $n < 7.571$ B1 : $-3 + (n-1)7 < 43$		3

10(a)	-3 B1 : $k+4-3k=11-(k+4)$	2 2	4
(b)	208 B1 : $S_8=\frac{8}{2}\left[2(-9)+(8-1)(10)\right]$		
11 (a)	$\frac{1}{2}$ *or* 0.5 B1 : $8r^5=\frac{1}{4}$	2	4
(b)	16 B1 : $\frac{8}{1-\frac{1}{2}}$	2	
12(a)	$\log_{10} y = x\log_{10} p + 2$	1	3
(b)	0.3162 B1 : $\log_{10} p=\frac{2-0}{0-4}$	2	
13 (a)	(3, 1)	1	4
(b)	$x-y-5=0$ *or equivalent* B2 : $\sqrt{(x-3)^2+(y-1)^2}$ = $\sqrt{(x-6)^2+(y+2)^2}$ B1 : $\sqrt{(x-3)^2+(y-1)^2}$ *or* $\sqrt{(x-6)^2+(y-(-2))^2}$	3	
14	$k = 5$ B2: $\frac{1}{2}\left\|(-1\times k+2\times 11+4\times -4)-(-4\times 2+k\times 4+11\times -1)\right\|=0$ *OR* $\frac{k-(-4)}{2-(-1)}=\frac{11-k}{4-2}$ B1: $\frac{1}{2}\left\|(-1\times k+2\times 11+4\times -4)-(-4\times 2+k\times 4+11\times -1)\right\|$ *OR* $\frac{k-(-4)}{2-(-1)}$ *or* $\frac{11-k}{4-2}$ *or* $\frac{11-(-4)}{4-(-1)}$		3
15(a)	$\begin{pmatrix}4\\5\end{pmatrix}$	1	2
(b)	$7\underset{\sim}{i}+5\underset{\sim}{j}$	1	
16 (a)	3 B1: $2\lambda=4$	2 2	4

(b)	$\sqrt{13}$ *or* 3.606 B1: $\sqrt{(4-2)^2+(6-3)^2}$		
17	30°,150° [*both*] B2 : $(2\sin x-1)(2\sin x-1)=0$ B1 : $4(1-\sin^2 x)+4\sin x-5=0$		3
18	0.571 B2: $8(\pi-\theta)=8+8+8\theta$ B1: $8(\pi-\theta)$ or 8θ		3
19	k = $\frac{3}{2}$ or 1.5 or $1\frac{1}{2}$ B1: $0 = 2k(3) - 9$		2
20(a)	5 B1: $2x$-3	2	4
(b)	$\frac{p}{5}$ *or* $0.2p$ B1 : $p=5\delta x$	2	
21	$\frac{8}{3}$ *or* $2\frac{2}{3}$ *or* 2.667 B3 : 8 - $\left[\frac{16}{3}\right]$ B2 : $\left[\frac{x^2}{2}\right]_0^4$ *or* $\left[\frac{x^2}{x-1}\right]_0^4$ B1 : $\int x dx - \int f(x)dx$		4
22 (a)	11	1	
(b)	6 B1 : $Q_1 = 4.5$ *or* $Q_3 = 10.5$	2	3
23 (a)	720	1	
(b)	144 B1 : 3! x 4!	2	3
24 (a)	$\frac{3}{20}$ *or* 0.15	1	
(b)	$\frac{11}{20}$ *or* 0.55 B1 : $\frac{3}{5}\times\frac{3}{4}$ *or* $\frac{2}{5}\times\frac{1}{4}$	2	3

25 (a)	$k = 0.7$ B1 : 0.2420 *OR* 0.4840 (*seen*)	2	4
(b)	32.8 B1 : $0.7 = \frac{X - 30}{4}$	2	