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

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 / *KALKULUS*

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

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

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

4   Area under a curve
Luas di bawah lengkung

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

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

5   Volume of revolution
Isi padu kisaran

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

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

GEOMETRY / *GEOMETRI*

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

2   Mid Point / *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 segi tiga*

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

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

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

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

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*
$$= \dfrac{1}{2} ab \sin C$$

[Lihat halaman sebelah

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

1 Diagram 1 shows a circle with centre O which is divided into twelve sectors. The angles of the sectors form a progression with the first term of $p°$.

Rajah 1 menunjukkan sebuah bulatan dengan pusat O yang telah dibahagikan kepada dua belas sektor. Sudut sektor-sektor itu membentuk suatu janjang dengan sebutan pertama p°.
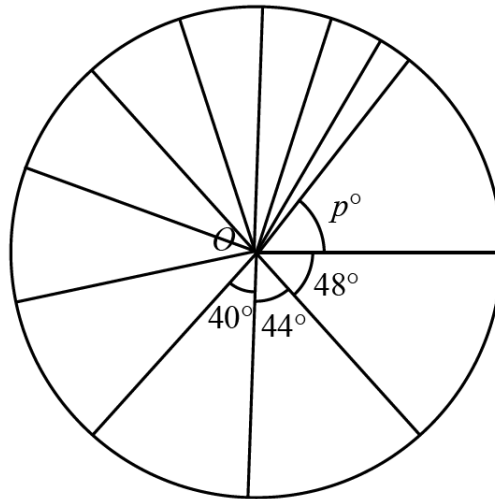

Diagram 1 / *Rajah* 1

(*a*) State whether the progression is an arithmetic progression or a geometric progression.

Nyatakan sama ada janjang itu ialah suatu janjang aritmetik atau janjang geometri.

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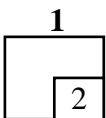
Cari nilai p.

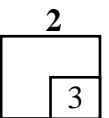[2 *marks*] / [2 *markah*]

Answer / *Jawapan*:

(*a*)

(*b*)

1

2
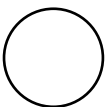
2 Given that $2k, 3k+4, 6k+8, ...$ are the first three consecutive terms of a geometric progression.

Find the positive value of *k*. [3 *marks*]

Diberi bahawa $2k, 3k+4, 6k+8, ...$ ialah tiga sebutan berturutan bagi suatu janjang geometri.

Cari nilai positif bagi k. [3 *markah*]
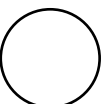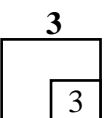
Answer / *Jawapan*:

2
3

---

3 Given that $\dfrac{3}{k} = 0.09 + 0.0009 + 0.000009 + ...$ is a series of infinities with *k* is a positive integer.

Find the value of *k*. [3 *marks*]

Diberi $\dfrac{3}{k} = 0.09 + 0.0009 + 0.000009 + ...$ ialah satu siri yang tak terhingga dengan k ialah satu integer positif.

Cari nilai k. [3 *markah*]

Answer / *Jawapan*:

3
3

4 Diagram 4 shows a graph of a quadratic function $f(x) = (x-p)^2 + q$, where p and q are constants. A straight line $y = 8$ is a tangent to the curve $y = f(x)$.

Rajah 4 menunjukkan suatu graf fungsi kuadratik $f(x) = (x-p)^2 + q$, dengan keadaan p dan q ialah pemalar. Garis lurus $y = 8$ ialah tangen kepada lengkung $y = f(x)$.
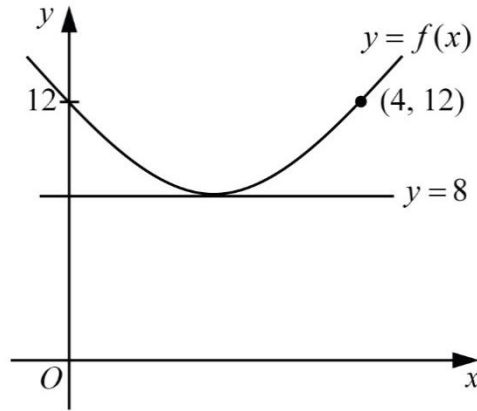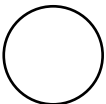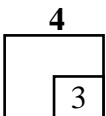

Diagram 4 / *Rajah* 4

State

Nyatakan

(*a*) the value of *p*,

   nilai p,

(*b*) the value of *q*

   nilai q,

(*c*) the equation of the axis of symmetry

   persamaan paksi simetri.

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

Answer / *Jawapan*:
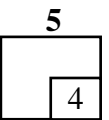
(*a*)

(*b*)

(*c*)

4

3

5 Given $x^2 = \dfrac{4x + y}{2}$, find the range of value of x if $y \le 6$.

Diberi $x^2 = \dfrac{4x + y}{2}$, cari julat bagi nilai x jika $y \le 6$.

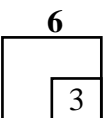[4 *marks*] / [4 *markah*]

Answer / *Jawapan*:

5
4

6 If α and β are the roots of the quadratic equation $x^2 + 5x - 2 = 0$, form a quadratic equation which has roots of $\dfrac{\alpha}{2}$ and $\dfrac{\beta}{2}$.
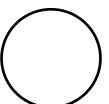
Jika α dan β ialah punca persamaan kuadratik $x^2 + 5x - 2 = 0$, bentukkan persamaan kuadratik yang mempunyai punca $\dfrac{\alpha}{2}$ dan $\dfrac{\beta}{2}$.

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

Answer / *Jawapan*:

6
3

7 Find the range of value of *p* in terms of *k* if the quadratic equation $px^2 + kx + 4 = 0$ does not have real roots.

Carikan julat nilai p dalam sebutan k jika persamaan kuadratik $px^2 + kx + 4 = 0$ tidak mempunyai punca nyata.

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

Answer / *Jawapan*:

7

3

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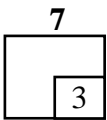
8 Solve the equation $\sqrt{81^x} = \dfrac{1}{9^{x-1}}$. [3 *marks*]

Selesaikan persamaan $\sqrt{81^x} = \dfrac{1}{9^{x-1}}$. [3 *markah*]

Answer / *Jawapan*:

8

3

9 Given that $1 + 2x \log_p x = x \log_p x$.

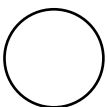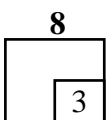Express *p* in terms of *x*. [4 *marks*]

Diberi $1 + 2x \log_p x = x \log_p x$.

Ungkapkan p dalam sebutan x. [4 *markah*]

Answer / *Jawapan*:

9

4
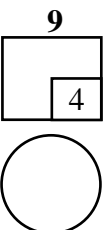
10 The relation between Set $A = \{-2m, -3, -1, 1, 3, 4\}$ and Set $B = \{1, 3, 4\}$ is defined by the following set of ordered pairs:

$$\{(-2m, 4), (-3, 3), (-1, 1), (1, 1), (3, 3), (4, 4)\}$$

Hubungan di antara Set $A = \{-2m, -3, -1, 1, 3, 4\}$ *dan* Set $B = \{1, 3, 4\}$ *ditakrifkan oleh set pasangan bertertib berikut*:

$$\{(-2m, 4), (-3, 3), (-1, 1), (1, 1), (3, 3), (4, 4)\}$$

State

Nyatakan

(*a*) the value of *m*,

     nilai m,

(*b*) the type of the relation.

     jenis hubungan itu.

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

Answer / *Jawapan*:

(*a*)

(*b*)
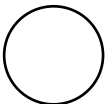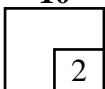
11 Given the function $f : x \rightarrow \dfrac{hx+k}{x-2}, x \neq 2$ and its inverse function $f^{-1} : x \rightarrow \dfrac{2x-5}{x-3}, x \neq 3.$

Find the value of *h* and of *k*.   [3 *marks*]

Diberi fungsi $f : x \rightarrow \dfrac{hx+k}{x-2}, x \neq 2$ dan fungsi songsangnya $f^{-1} : x \rightarrow \dfrac{2x-5}{x-3}, x \neq 3.$

Cari nilai h dan nilai k.   [3 *markah*]

Answer / *Jawapan*:

11

3

12 Diagram 12 shows the location of Aimi's house, swimming pool and Mira's house on a Cartesian plane.

Rajah 12 menunjukkan lokasi rumah Aimi, kolam renang dan rumah Mira pada satu satah Cartesan.
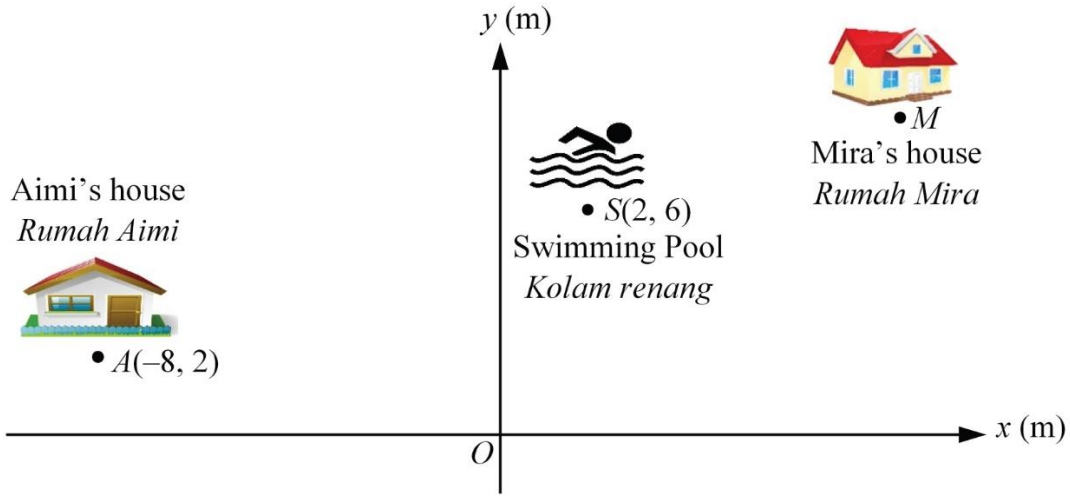
Diagram 12 / *Rajah 12*

Points A, S and M are the centres of the location. A, S and M are collinear such that the distance of Aimi's house from Mira's house is thrice the distance of swimming pool from Mira's house.

Find the location coordinate of Mira's house. [3 *marks*]

Titik-titik A, S dan M adalah masing-masing pusat lokasi. A, S dan M adalah segaris dengan keadaan jarak rumah Aimi dari rumah Mira adalah tiga kali jarak kolam renang dari rumah Mira.

Cari koordinat lokasi rumah Mira. [3 *markah*]

Answer / *Jawapan*:

12

| 3 |
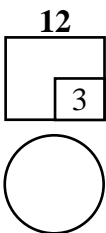
13 Diagram 13 shows a straight-line *PQ* with the equation $\dfrac{x}{18} + \dfrac{y}{9z} = 1$.

Rajah 13 *menunjukkan sat ugaris lurus PQ dengan persamaan* $\dfrac{x}{18} + \dfrac{y}{9z} = 1$.
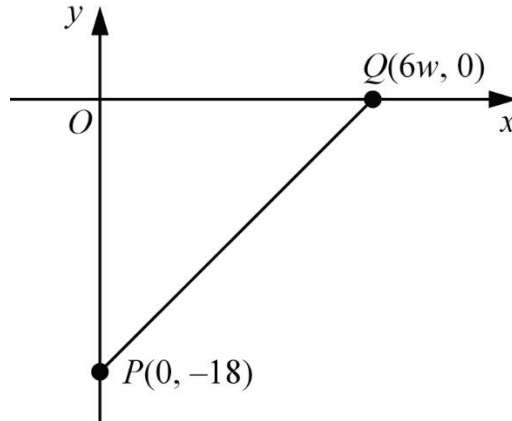
Diagram 13 / *Rajah* 13

(*a*) Find the value of *w* and of *z*.
Cari nilai w dan nilai z.

(*b*) Find the gradient of the straight line.
Cari kecerunan garis lurus itu.

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

Answer / *Jawapan*:

(*a*)

(*b*)

13

3

14 The vectors $\underline{a}$ and $\underline{b}$ are non-zero vectors and non-parallel vectors. Given that $(h-2)\underline{a} = (2k+3-h)\underline{b}$, where h and k are constants.

Find the value of h and of k. [3 *marks*]

Vektor $\underline{a}$ dan $\underline{b}$ adalah vektor bukan sifar dan vektor tidak selari. Diberi bahawa $(h-2)\underline{a} = (2k+3-h)\underline{b}$, dengan keadaan h dan k ialah pemalar.

Cari nilai h dan nilai k. [3 *markah*]

Answer / *Jawapan*:

14

3

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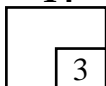
15 Given points $A(-1, 6)$ and O is the origin.

Find the unit vector in the direction of $\overrightarrow{OA}$. [3 *marks*]

Diberi titik $A(-1, 6)$ dan O adalah asalan.

Cari vektor unit dalam arah vektor $\overrightarrow{OA}$. [3 *markah*]

Answer / *Jawapan*:

15

3
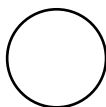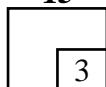
16 A tank has a rectangular base of length $2x$ m. Its width is half of the length of its base. The height of the tank is equal to its width. Given that the total surface area of the tank is 9.5 m^2.

Find the small change of the volume of the tank when x increases by 0.02 m. Give your answer to 4 significant figures. [3 *marks*]

Sebuah tangki mempunyai tapak yang berbentuk segiempat tepat dengan sisi panjang berukuran $2x$ m. Lebarnya ialah separuh daripada panjang tapak. Ketinggian tangki itu adalah sama dengan ukuran lebarnya. Diberi jumlah luas permukaan tangki itu ialah 9.5 m^2.

Cari perubahan kecil isi padu tangki itu apabila x bertambah sebanyak 0.02 m. Berikan jawapan anda kepada 4 angka bererti. [3 *markah*]

Answer / *Jawapan*:

16

3
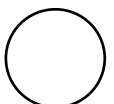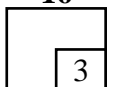
17 Solve the equation $\sin(2\beta + 60°) = 3\sqrt{3}\,\text{kos}2\beta$ for $0° \le \beta \le 360°$. [4 *marks*]

Selesaikan persamaan $\sin(2\beta + 60°) = 3\sqrt{3}\text{kos}2\beta$ *for* $0° \le \beta \le 360°$. [4 *markah*]

Answer / *Jawapan*:

18 Given that $y = \dfrac{2x+1}{3x^2}$ and $\dfrac{dy}{dx} = 3g(x)$. Find the value of $\displaystyle\int_{-1}^{1} g(x)\,dx$. [3 *marks*]

Diberi bahawa $y = \dfrac{2x+1}{3x^2}$ *dan* $\dfrac{dy}{dx} = 3g(x)$. *Cari nilai* $\displaystyle\int_{-1}^{1} g(x)\,dx$. [3 *markah*]

Answer / *Jawapan*:
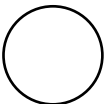
19 The variables, x and y are related by the equation $y = px - qx^3$.

Diagram 19 shows a straight-line MN is obtained by plotting $\dfrac{y}{x}$ against x^2.

Pembolehubah, x dan y dihubungkan oleh persamaan $y = px - qx^3$.

Rajah 19 menunjukkan garis lurus MN yang diperoleh dengan memplot $\dfrac{y}{x}$ melawan x^2.
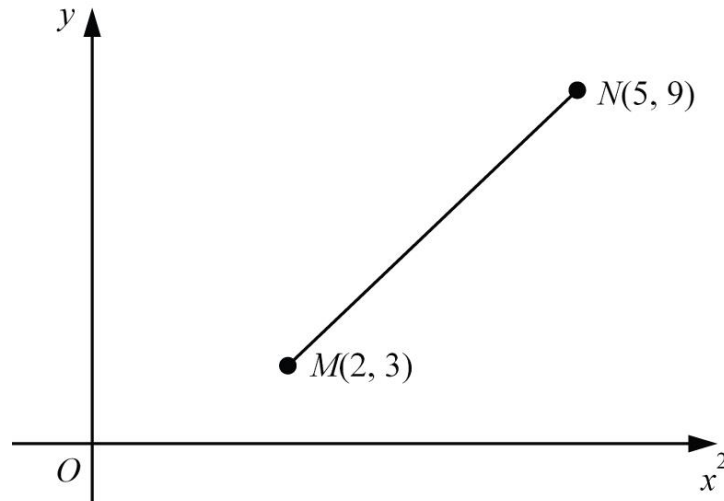
Diagram 19 / *Rajah* 19

Find the values of p and of q.   [3 *marks*]

Cari nilai p dan nilai q.   [3 *markah*]

Answer / *Jawapan*:

19

3

20 A group of 5 students are to be chosen from 9 boys and 7 girls to form a school's debate team.

Find the number of different ways to form the team which consists of.

Satu kumpulan 5 orang murid hendak dipilih daripada 9 orang murid lelaki dan 7 orang murid perempuan untuk membentuk satu pasukan debat sekolah.

Cari bilangan cara berbeza untuk membentuk pasukan yang terdiri daripada

(*a*) boys only,

   murid lelaki sahaja,

(*b*) at least 4 girls.

   sekurang-kurangnya 4 orang murid perempuan.

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

Answer / *Jawapan*:

(*a*)

(*b*)

20

4
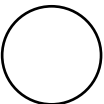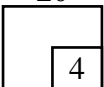
21 Azhar wants to buy 2 goldfish from a pet shop to increase the number of fish in his aquarium at home. In the pet shop, there are 9 of female fish and 8 of male fish in the tank but they all looks the same.

Azhar ingin membeli 2 ekor ikan emas daripada sebuah kedai peliharaan haiwan untuk menambah bilangan ikan di dalam akuariumnya di rumah. Dalam kedai haiwan peliharaan itu, didapati bahawa dalam tangki ikan tersebut terdapat 9 ekor ikan betina dan 8 ekor ikan jantan tetapi mereka semua kelihatan serupa.

Find the probability that

Cari kebarangkalian bahawa

(*a*) both fish are of the same sex,

   kedua-duanya mempunyai jantina yang sama,

(*b*) both fish are female.

   kedua-duanya ikan betina.

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

Answer / *Jawapan*:

(*a*)

(*b*)

21

3

22 Adam is one of the archers who represents his school in Secondary School's Archery Tournament. During the practice, Adam has done 5 trial shots. The probability that Adam strikes the target is p, where p is a constant. The coach then produces a sketch of the graph of probability distribution for the number of shots that strikes the target obtaining by Adam as shown in Diagram 22.

Adam ialah salah seorang pemanah yang mewakili sekolahnya dalam Pertandingan Memanah Peringkat Sekolah Menengah. Semasa latihan memanah, Adam telah membuat 5 kali percubaan. Kebarangkalian bahawa Adam kena sasaran ialah p, di mana p ialah satu pemalar. Jurulatihnya kemudian menghasilkan satu lakaran graf bagi taburan kebarangkalian untuk bilangan kali Adam kena sasaran seperti yang ditunjukkan dalam Rajah 22.
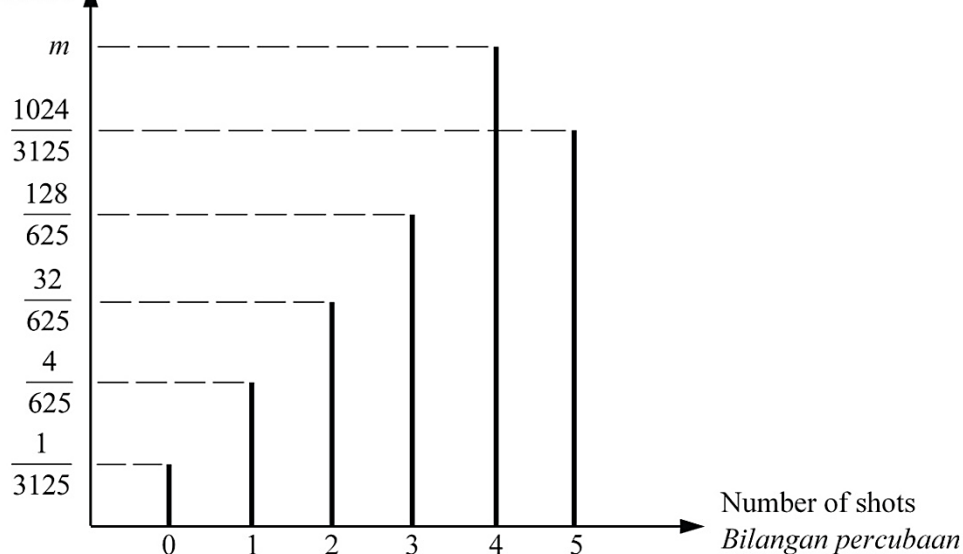
Diagram 22 / *Rajah* 22

(a) Find the values of p and of m,

Cari nilai p dan nilai m,

(b) Calculate the standard deviation of the number of shots that strikes the target obtained by Adam.

Hitung sisihan piawai bagi bilangan cubaan yang mengenai sasaran yang dibuat oleh Adam.

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

Answer / *Jawapan*:

(*a*)

(*b*)

22

4

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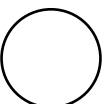
23 Diagram 23 shows sector *OAB* and sector *OCD* which both sectors with centre *O*.

Rajah 23 *menunjukkan sektor OAB dan sektor OCD di mana kedua-dua sektor dengan pusat O.*
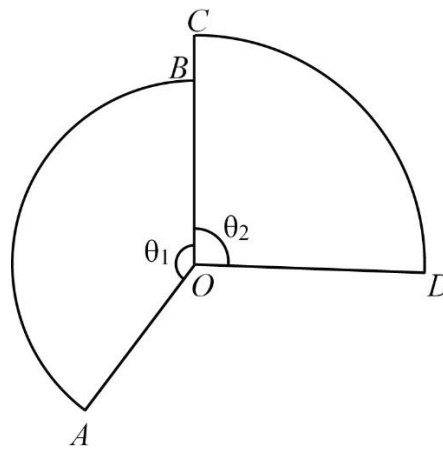
Diagram 23 / *Rajah* 23

Given the perimeter of the sector *OAB* is 54 cm, the area of the sector *OAB* is $180 \, \text{cm}^2$ and $\theta_1 > \theta_2$.

If the sector *OCD* has perimeter and area equal to the sector *OAB*, find θ_1 in radians.

Diberi perimeter sektor OAB ialah 54 cm, *luas sektor OAB ialah* 180 cm^2 *dan* $\theta_1 > \theta_2$.

Jika sektor OCD mempunyai perimeter dan luas yang sama dengan sektor OAB, cari θ_1 *dalam radian.*

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

Answer / *Jawapan*:

23

4
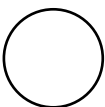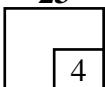
24 Given 4 and 7 respectively are mod and min for a set of data 3, 4, 4, 6, 10, 12, 12, m, n, with $m > n$.

Diberi 4 *dan* 7 *masing-masing ialah mod dan min bagi satu set data* 3, 4, 4, 6, 10, 12, 12, *m*, *n*, *dengan* $m > n$.

Find

Cari

(*a*) the value of p and of q,

    nilai m dan nilai n,

(*b*) median

    median

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

Answer / *Jawapan*:

(*a*)

(*b*)
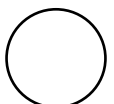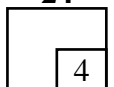
25 The quartile range and the standard deviation of a set of data are 6 and 2.4 respectively.

If each value in the data is divided by 3 then added by 8, find

Julat antara kuartil dan sisihan piawai bagi suatu set data masing-masing ialah 6 *dan* 2.4.

Jika setiap nilai dalam data itu dibahagi dengan 3 *kemudian ditambah dengan* 8, *cari*

(*a*) the new quartile range,
     julat antara kuartil yang baharu,

(*b*) the new variance.
     varians yang baharu.

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

Answer / *Jawapan*:

(*a*)

(*b*)

END OF QUESTION PAPER
KERTAS PEPERIKSAAN 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)

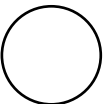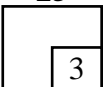| z	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
														Minus / *Tolak*					
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641	4	8	12	16	20	24	28	32	36
0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	4	8	12	16	20	24	28	32	36
0.2	0.4207	0.4168	0.4129	0.4090	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

For negative z use relation:
Bagi z negatif guna hubungan:

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

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

$$Q(z) = \int_k^\infty f(z)\,dz$$
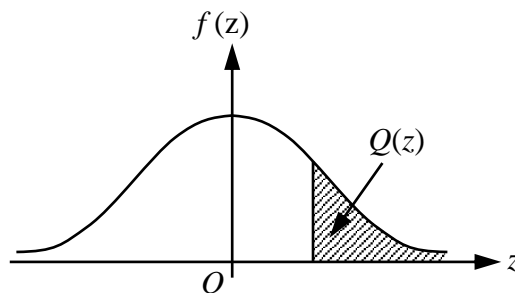
Example / *Contoh*:
If $X \sim N(0, 1)$, then
Jika X ~ N(0, 1), maka
$P(X > k) = Q(k)$
$P(X > 2.1) = Q(2.1) = 0.0179$

INFORMATION FOR CANDIDATES
MAKLUMAT UNTUK CALON

1. This question paper consists of **25** questions.

   *Kertas soalan ini mengandungi **25** soalan.*

2. Answer **all** questions.

   *Jawab **semua** soalan.*

3. Write your answers in the 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 baharu.

6. The diagrams in the questions provided are not drawn to scale unless stated.

   Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.

7. The marks allocated for each question are shown in brackets.

   Markah yang diperuntukkan bagi setiap soalan ditunjukkan dalam kurungan.

8. A list of formulae is provided on page **2** and **3**.

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

9. The Upper Tail Probability Q(*z*) For The Normal Distribution N(0, 1) Table is provided on page **25**.

   *Jadual Kebarangkalian Hujung Atas Q(z) bagi Taburan Normal N(0, 1) disediakan di halaman **25**.*

10. You may use a scientific calculator.

    Anda dibenarkan menggunakan kalkulator saintifik.

11. Hand in this question paper to the invigilator at the end of the examination.

    Serahkan kertas soalan ini kepada pengawas peperiksaan di akhir peperiksaan.