

NAMA .....

KELAS .....

3472/1

**Matematik  
Tambahan  
Kertas 1  
September  
2 jam**



**MAJLIS PENGETUA SEKOLAH MENENGAH MALAYSIA  
CAWANGAN NEGERI SEMBILAN DARUL KHUSUS**

**PROGRAM PENINGKATAN AKADEMIK TINGKATAN 5  
SEKOLAH-SEKOLAH NEGERI SEMBILAN 2015**

| MATEMATIK TAMBAHAN<br>Kertas 1<br>Dua jam  | Untuk Kegunaan Pemeriksa |              |                  |
|--|--------------------------|--------------|------------------|
|  | Soalan                   | Markah Penuh | Markah Diperoleh |
| <p><b>JANGAN BUKA KERTAS SOALAN INI<br/>SEHINGGA DIBERITAHU</b></p> <p>1 <i>Tulis nama dan kelas anda pada ruangan yang disediakan.</i></p> <p>2 <i>Kertas soalan ini adalah dalam dwibahasa.</i></p> <p>3 <i>Soalan dalam Bahasa Inggeris mendahului soalan yang sepadan dalam Bahasa Melayu.</i></p> <p>4 <i>Calon dibenarkan menjawab keseluruhan atau sebahagian soalan sama ada dalam Bahasa Inggeris atau Bahasa Melayu.</i></p> <p>5 <i>Calon dikehendaki membaca maklumat di halaman 24.</i></p> | <b>1</b>                 | 2            |                  |
|  | <b>2</b>                 | 4            |                  |
|  | <b>3</b>                 | 3            |                  |
|  | <b>4</b>                 | 3            |                  |
|  | <b>5</b>                 | 3            |                  |
|  | <b>6</b>                 | 2            |                  |
|  | <b>7</b>                 | 3            |                  |
|  | <b>8</b>                 | 4            |                  |
|  | <b>9</b>                 | 3            |                  |
|  | <b>10</b>                | 3            |                  |
|  | <b>11</b>                | 3            |                  |
|  | <b>12</b>                | 4            |                  |
|  | <b>13</b>                | 4            |                  |
|  | <b>14</b>                | 3            |                  |
|  | <b>15</b>                | 3            |                  |
|  | <b>16</b>                | 3            |                  |
|  | <b>17</b>                | 4            |                  |
|  | <b>18</b>                | 4            |                  |
|  | <b>19</b>                | 4            |                  |
|  | <b>20</b>                | 3            |                  |
|  | <b>21</b>                | 2            |                  |
|  | <b>22</b>                | 3            |                  |
|  | <b>23</b>                | 4            |                  |
|  | <b>24</b>                | 3            |                  |
|  | <b>25</b>                | 3            |                  |
| <b>JUMLAH</b>  | 80                       |              |                  |

Kertas soalan ini mengandungi 24 halaman bercetak.

[Lihat halaman sebelah

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

$$1. x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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

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

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

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

$$6. \log_a \frac{m}{n} = \log_a m - \log_a n$$

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

$$8. \log_a b = \frac{\log_c b}{\log_c a}$$

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

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

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

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

$$13. S_\infty = \frac{a}{1 - r}$$

### CALCULUS KALKULUS

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

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

$$3. \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$$

4. Area under a curve

Luas di bawah lengkung

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

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

5. Volume generated

Isipadu janaan

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

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

**STATISTICS**  
**STATISTIK**

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

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

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

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

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

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

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

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

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

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

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

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

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

$$14 \quad z = \frac{x - \mu}{\sigma}$$

**GEOMETRY**  
**GEOMETRI**

1 Distance / *Jarak*

$$= \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

2 Midpoint / *Titik tengah*

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

3 A point dividing a segment of a line

*Titik yang membahagi suatu tembereng garis*

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

4 Area of triangle / *Luas segi tiga*

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

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

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

**TRIGONOMETRY**  
**TRIGONOMETRI**

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

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

1. Diagram 1 shows the relation between set  $X$  and set  $Y$  in the graph form.  
 Rajah 1 menunjukkan hubungan antara set  $X$  dan set  $Y$  dalam bentuk graf.

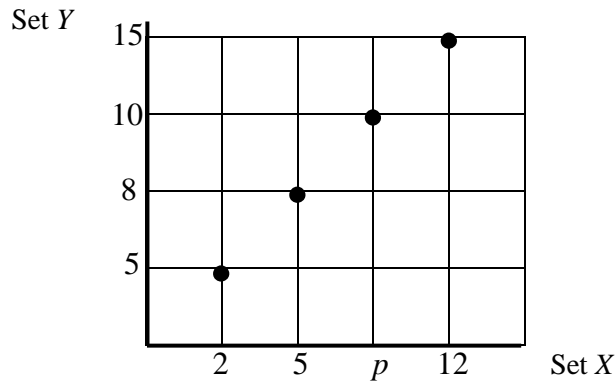


Diagram 1  
 Rajah 1

- (a) State the type of relation between set  $X$  and set  $Y$ .  
 Nyatakan jenis hubungan antara set  $X$  dan set  $Y$ .
- (b) State the value of  $p$ .  
 Nyatakan nilai  $p$ .

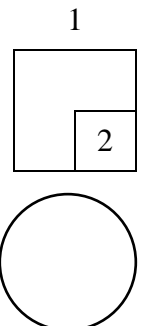
[2 marks]  
 [2 markah]

Answer / Jawapan:

(a)

(b)

For  
 Examiner's  
 Use/  
 Untuk  
 Kegunaan  
 Pemeriksa



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Untuk  
Kegunaan  
Pemeriksa

2. Given the function  $f: x \rightarrow 3 - 4x$  and  $h: x \rightarrow \frac{x}{2}$ , find

Diberi fungsi  $f: x \rightarrow 3 - 4x$  dan  $h: x \rightarrow \frac{x}{2}$ , cari

- (a)  $fh(x)$ ,  
(b) the value of  $x$  if  $fh(x) = h(x) - 5$ .  
nilai  $x$  jika  $fh(x) = h(x) - 5$ .

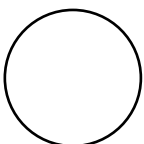
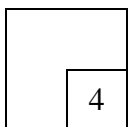
[4 marks]  
[4 markah]

Answer / Jawapan :

(a)

(b)

2



3. Given the function  $k : x \rightarrow \frac{5}{x} + 1$ , find the value of

*Diberi fungsi  $k : x \rightarrow \frac{5}{x} + 1$ , cari nilai bagi*

(a)  $k\left(-\frac{2}{3}\right)$ ,

(b) the value of  $m$  when  $k^{-1}(m) = 2$ .  
*nilai bagi  $m$  apabila  $k^{-1}(m) = 2$ .*

Answer / *Jawapan* :

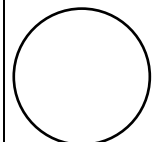
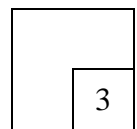
(a)

(b)

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Kegunaan  
Pemeriksa

[3 marks]  
[3 markah]

3



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Kegunaan  
Pemeriksa

4. Diagram 4 shows the function  $f(x) = px^2 - px + 3x + 1$ .  
Rajah 4 menunjukkan fungsi  $f(x) = px^2 - px + 3x + 1$ .

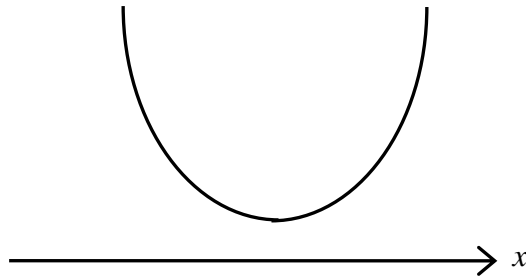


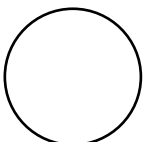
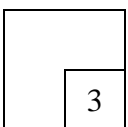
Diagram 4  
Rajah 4

Find the range of value of  $p$ .  
Cari julat nilai  $p$ .

[3 marks]  
[3 markah]

Answer / Jawapan :

4





5. Diagram 5 shows the movement of a ball that was thrown.  
*Rajah 5 menunjukkan gerakan sebiji bola selepas dilontar.*

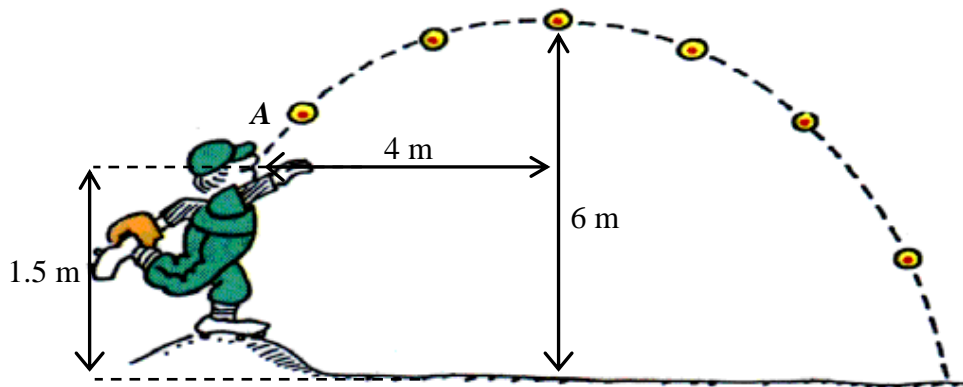


Diagram 5  
*Rajah 5*

The ball is thrown at the height of 1.5 m from the ground. The ball achieved its maximum height of 6 m at a horizontal distance of 4 m from point A.  
 Write a quadratic function which represents the movement of the ball.

[3 marks]

*Bola tersebut dilontar pada ketinggian 1.5 m dari lantai. Bola tersebut mencapai tinggi maksimum 6 m apabila berada pada jarak mengufuk 4 m dari titik A.*

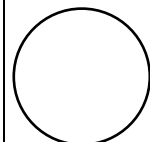
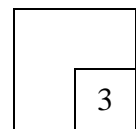
*Tulis satu fungsi kuadratik yang mewakili gerakan tersebut.*

[3 markah]

Answer / Jawapan :

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 Pemeriksa

5



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Kegunaan  
Pemeriksa

6. Given that one of the roots of the quadratic equation  $2x^2 - px + 2p + 1 = 0$  is  $\frac{3}{4}$ .  
 Diberi bahawa salah satu punca bagi persamaan kuadratik  
 $2x^2 - px + 2p + 1 = 0$  ialah  $\frac{3}{4}$ .

Find value of  $p$ .

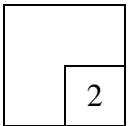
[2 marks]

Cari nilai  $p$ .

[2 markah]

Answer / Jawapan :

6



7. Given  $\frac{16^{2-3n}}{\sqrt{32^n}} = 128$ , find the value of  $n$ .

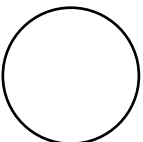
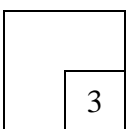
[3 marks]

Diberi  $\frac{16^{2-3n}}{\sqrt{32^n}} = 128$ , cari nilai  $n$ .

[3 markah]

Answer / Jawapan :

7



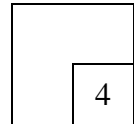
11

8. Given that  $\log_9 4 = k$  and  $9^{5-n} = 36$ , express  $n$  in terms of  $k$ . [ 4 marks]  
 Diberi bahawa  $\log_9 4 = k$  dan  $9^{5-n} = 36$ , ungkapkan  $n$  dalam sebutan  $k$ . [ 4 markah]

Answer / Jawapan :

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Kegunaan  
Pemeriksa

8



9. Given the geometric progression  $20, 5, \frac{5}{4}, \dots$ , find  
 Diberi jangjang geometri  $20, 5, \frac{5}{4}, \dots$ , cari

- a) the value of common ratio,  
 nilai bagi beza sepunya,  
 b) the sum to infinity of the progression.  
 hasil tambah hingga ketakterhinggaan jangjang itu.

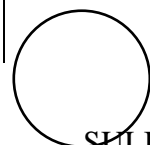
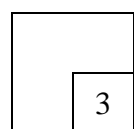
[3 marks]  
[3 markah]

Answer / Jawapan:

(a)

(b)

9



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Pemeriksa

10. Diagram 10 shows the arrangement of cuboids having the same base area,  $4 \text{ cm}^2$ . height of the first cuboid is 8 cm and the height of each subsequent cuboid increases by 3 cm.

*Rajah 10 menunjukkan susunan beberapa kuboid yang mempunyai luas tapak yang sama,  $4 \text{ cm}^2$ . Tinggi kuboid yang pertama ialah 8 cm dan tinggi setiap kuboid yang berikutnya bertambah sebanyak 3 cm.*

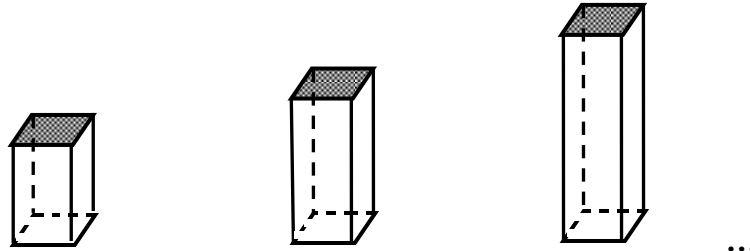


Diagram 10  
*Rajah 10*

The blocks are used to decorate one of the corners at the Mathematics room.  
Given that the volume of the decorating space is  $2000 \text{ cm}^3$ .

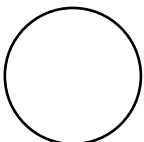
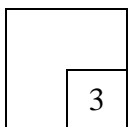
*Blok-blok tersebut digunakan untuk menghiaskan salah satu sudut di bilik Matematik. Diberi bahawa isi padu sudut perhiasan tersebut ialah  $2000 \text{ cm}^3$ .*

Find the maximum number of blocks used in the decoration. [3 marks]

*Cari bilangan maksimum blok yang digunakan dalam perhiasan ini. [3 markah]*

Answer / Jawapan :

10



11. Diagram 11(a) shows part of the curve  $y^2 = 5 + hx$ , where  $h$  is a constant. Diagram 11(b) shows the straight line obtained when the curve is reduced to the linear form.

*Rajah 11 (a) menunjukkan sebahagian lengkung  $y^2 = 5 + hx$ , dengan keadaan  $h$  adalah pemalar. Rajah 11(b) menunjukkan garis lurus yang diperolehi apabila lengkung ditukar kepada bentuk linear.*

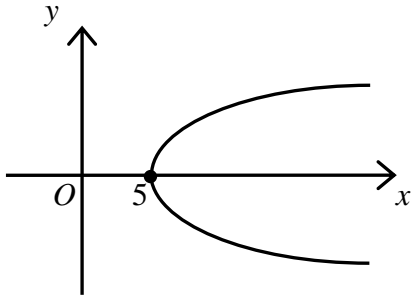


Diagram 11(a)  
Rajah 11(a)

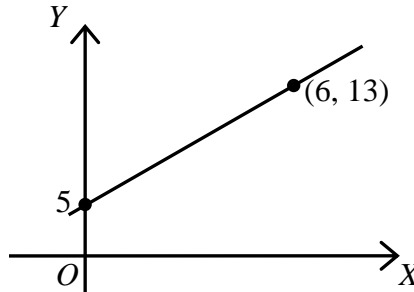


Diagram 11(b)  
Rajah 11(b)

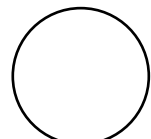
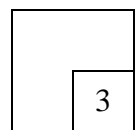
- (a) Write  $Y$  in terms of  $y$ .  
*Tulis  $Y$  dalam sebutan  $y$ .*
- (b) Find the value of  $h$ .  
*Cari nilai  $h$ .*

[3 marks]  
[3 markah]

Answer / Jawapan :

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Pemeriksa

11



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Kegunaan  
Pemeriksa

12. Diagram 12 shows a piece of fan-shaped paper  $ABCD$ .  $O$  is the centre of arc  $AB$  and  $CD$ .  
*Rajah 12 menunjukkan sekeping kertas  $ABCD$  yang berbentuk kipas.  $O$  ialah pusat bagi lengkok  $AB$  dan  $CD$ .*

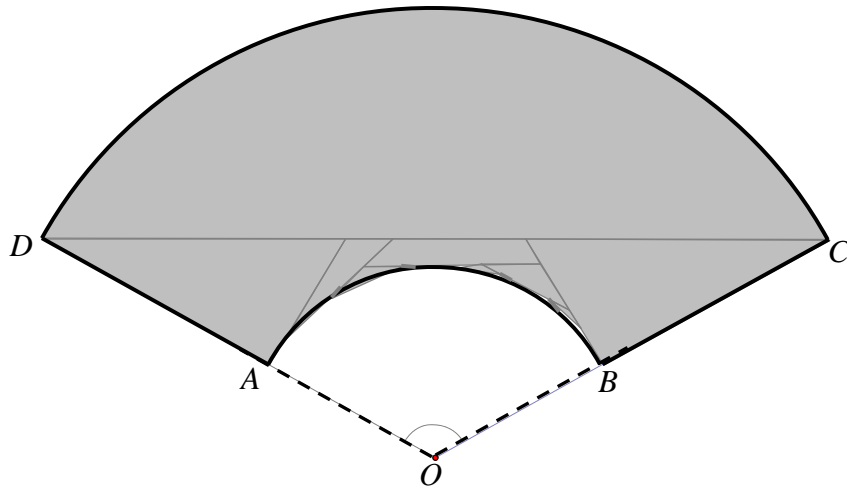


Diagram 12  
Rajah 12

It is given that  $\angle COD = 2.65$  radians,  $3OB = 2BC$  and  $OC = 30$  cm.

*Diberi bahawa  $\angle COD = 2.65$  radian,  $3OB = 2BC$  dan  $OC = 30$  cm.*

Find  
Cari

- (a) the area of the fan-shaped paper, in  $\text{cm}^2$ ,  
*luas kertas yang berbentuk kipas, dalam  $\text{cm}^2$ ,*
- (b) the maximum number of fan-shaped paper can be made by using a piece of paper with the area of  $8000 \text{ cm}^2$ .  
*bilangan maksimum kertas berbentuk kipas boleh dibentuk daripada sehelai kertas dengan luasnya  $8000 \text{ cm}^2$ .*

[4 marks]

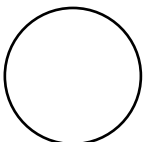
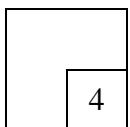
[4 markah]

Answer / Jawapan :

(a)

(b)

12



13. Given that  $\vec{p} = k\vec{i} - 7\vec{j}$  and  $\vec{q} = \vec{i} + 2\vec{j}$ , find

Diberi  $\vec{p} = k\vec{i} - 7\vec{j}$  dan  $\vec{q} = \vec{i} + 2\vec{j}$ , cari

(a)  $2\vec{p} + \vec{q}$  in the form  $x\vec{i} + y\vec{j}$ ,

$2\vec{p} + \vec{q}$  dalam bentuk  $x\vec{i} + y\vec{j}$ ,

(b) the values of  $k$  if  $|2\vec{p} + \vec{q}| = 15$ .

nilai-nilai bagi  $k$  jika  $|2\vec{p} + \vec{q}| = 15$ .

Answer / Jawapan :

(a)

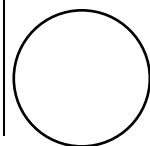
(b)

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Pemeriksa

[4 marks]

[4 markah]

13



[Lihat halaman sebelah



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Use/  
Untuk  
Kegunaan  
Pemeriksa

14. Diagram 14 shows vectors  $\vec{p}$  and  $\vec{q}$ .

Rajah 14 menunjukkan vektor  $\vec{p}$  dan  $\vec{q}$ .

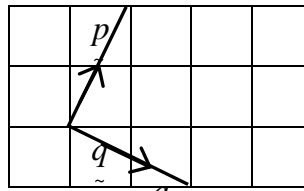


Diagram 14  
Rajah 14

Using the diagram given in the answer space  
Dengan menggunakan rajah yang diberi dalam ruang jawapan

(a) determine the destination of Ahmad. He starts his journey from his house by following the vector  $\vec{p} - 3\vec{q}$ .

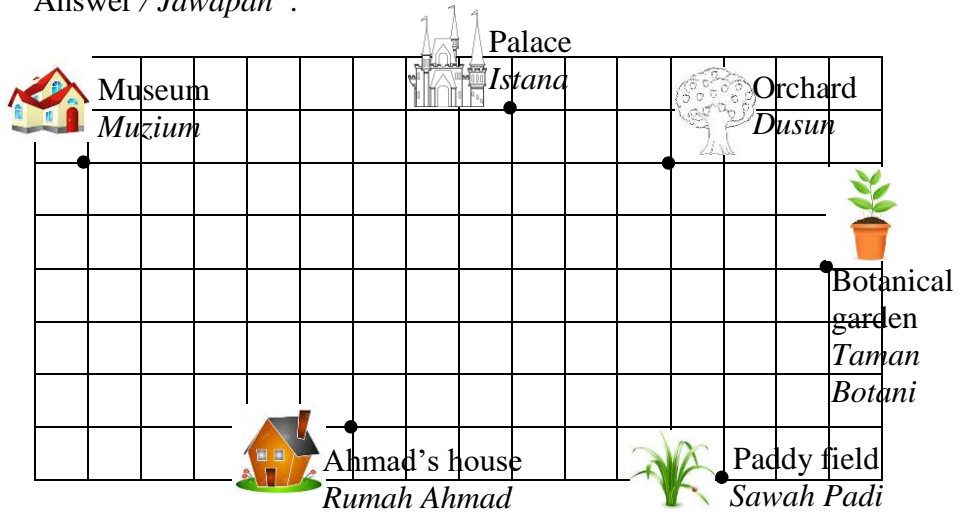
tentukan destinasi Ahmad. Dia memulakan perjalanan dari rumah mengikut vektor  $\vec{p} - 3\vec{q}$ .

(b) write the vector in terms of  $\vec{p}$  and  $\vec{q}$ , if Ahmad departs from the palace to the paddy field.

tulis vektor dalam sebutan  $\vec{p}$  dan  $\vec{q}$ , jika Ahmad bertolak dari istana ke sawah padi.

[3 marks]  
[3 markah]

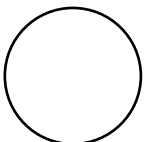
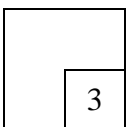
Answer / Jawapan :



(a) Destination of Ahmad : .....  
Destinasi Ahmad

(b)

14



15. Diagram 15 shows a straight line  $MN$ .  
*Rajah 15 menunjukkan satu garis lurus  $MN$ .*

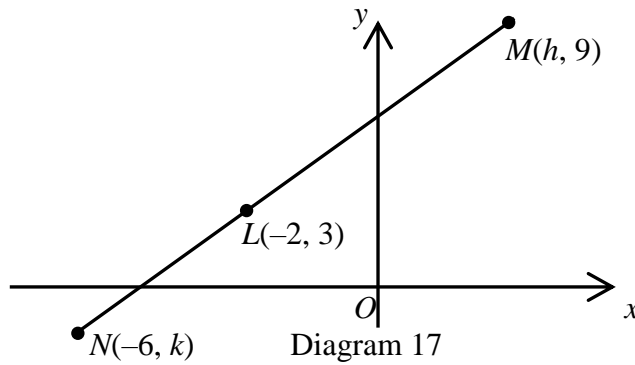


Diagram 17  
*Rajah 17*

The point  $L$  lies on  $MN$  such that  $ML : MN = 3 : 5$ .  
 Find the value of  $h$  and of  $k$ .

[3 marks]

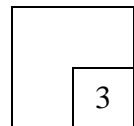
*Titik  $L$  terletak di atas  $MN$  dengan keadaan  $ML : MN = 3 : 5$ .  
 Cari nilai bagi  $h$  dan  $k$ .*

[3 markah]

Answer / *Jawapan* :

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 Untuk  
 Kegunaan  
 Pemeriksa

15



16. Given that  $\sin A = p$ , such that  $90^\circ \leq A \leq 180^\circ$ . Express in terms of  $p$   
*Diberi  $\sin A = p$ , dengan  $90^\circ \leq A \leq 180^\circ$ . Ungkapkan dalam sebutan  $p$*

(a) cosec  $A$ ,

*kosek  $A$ ,*

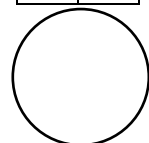
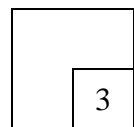
(b)  $\tan (180^\circ - A)$ .

[3 marks]

[3 markah]

Answer / *Jawapan*:

16



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Use/  
Untuk  
Kegunaan  
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17. Given that  $k + 1$ ,  $3 - k$ ,  $1 - 2k$  are the first three terms of an arithmetic progression. Find

*Diberi  $k + 1$ ,  $3 - k$ ,  $1 - 2k$  adalah tiga sebutan pertama bagi suatu jangjang aritmetik. Cari*

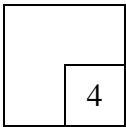
- (a) value of  $k$ ,  
*nilai  $k$ ,*  
(b) the sum of the first thirteen terms.  
*hasil tambah tiga belas sebutan pertama.*

[4 marks]

[4 markah]

Answer / Jawapan:

17



18. Given that  $\int_0^3 h(x) dx = 6$  and  $\int_3^5 h(x) dx = 10$ , find

*Diberi bahawa  $\int_0^3 h(x) dx = 6$  dan  $\int_3^5 h(x) dx = 10$ , cari*

(a)  $\int_0^5 h(x) dx$ ,

(b) the value of  $k$  if  $\int_0^5 [h(x) - kx] dx = 3$ .

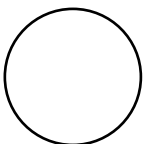
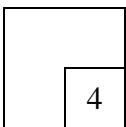
[4 marks]

*nilai  $k$  jika  $\int_0^5 [h(x) - kx] dx = 3$ .*

[4 markah]

Answer / Jawapan:

18



19.

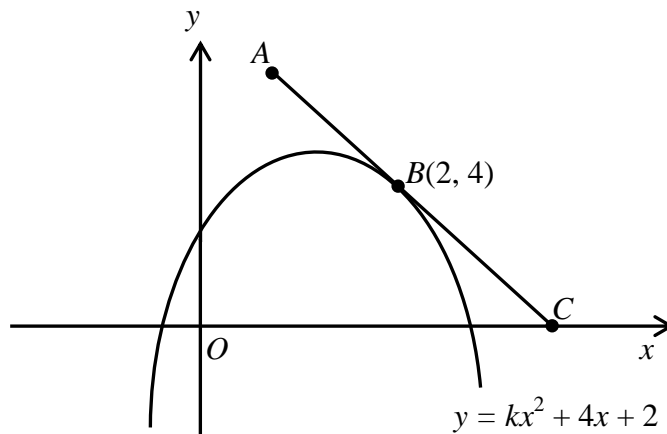


Diagram 19

Rajah 19

Diagram 19 shows a straight line  $AC$  and the curve  $y = kx^2 + 4x + 2$ , where  $k$  is a constant. The straight line  $AC$  touches the curve at point  $B(2, 4)$ .

*Rajah 19 menunjukkan garis lurus  $AC$  dan lengkung  $y = kx^2 + 4x + 2$ , dengan keadaan  $k$  ialah pemalar. Garis lurus  $AC$  menyentuh lengkung pada titik  $B(2, 4)$ .*

Find  
Cari

- (a) the value of  $k$ ,  
*nilai  $k$ ,*
- (b) the equation of the straight line  $AC$ .  
*persamaan garis lurus  $AC$ .*

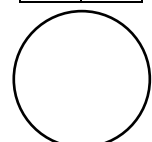
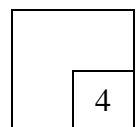
[4 marks]

[4 markah]

Answer / *Jawapan:*

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Kegunaan  
Pemeriksa

19



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Pemeriksa

20. Two variables,  $x$  and  $y$ , are related by the equation  $y = 4x^2 - 2x$ .  
Given that  $y$  increases at a constant rate of 2 units per second, find the rate of change of  $x$  when  $x = 3$ .

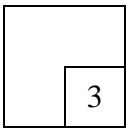
*Dua pemboleh ubah,  $x$  dan  $y$ , dihubungkan oleh persamaan  $y = 4x^2 - 2x$ .*

*Diberi bahawa  $y$  bertambah pada kadar 2 unit per saat, cari kadar perubahan bagi  $x$  apabila  $x = 3$ .* [3 marks]

[3 markah]

Answer / Jawapan:

20



21. Diagram 21 shows the quadratic curve  $x = g(y)$  and the line  $PQ$ . The straight line  $PQ$  is parallel to the  $y$ -axis.

*Rajah 21 menunjukkan fungsi kuadratik  $x = g(y)$  dan garis lurus  $PQ$ . Garis lurus  $PQ$  adalah selari dengan paksi-  $y$ .*

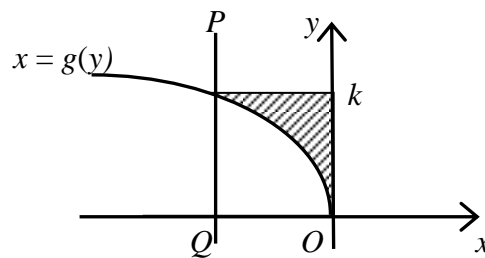


Diagram 21  
Rajah 21

Given that the area of the shaded region is  $\frac{1}{3}$  unit<sup>2</sup>, find the value of

$$\int_0^k 2g(y) dy.$$

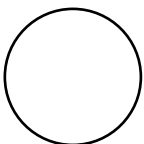
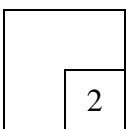
*Diberi bahawa luas rantau berlengk adalah  $\frac{1}{3}$  unit<sup>2</sup>, cari nilai  $\int_0^k 2g(y) dy$ .*

[2 marks]

Answer / Jawapan:

[2 markah]

21



22.



Diagram 22  
Rajah 22

Aini is a florist . On a certain day, she wants to hold a sale of flowers. Flowers are placed in the flower pots and are arranged on the console that is placed in a special corner. Diagram 22 shows 5 different flower pots. Find the number of different arrangement that can be done by Aini if the potted roses are separated from each other.

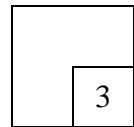
*Aini merupakan seorang penjual bunga. Pada suatu hari tertentu, beliau ingin mengadakan jualan bunga. Bunga-bunga tersebut diletakkan di dalam pasu bunga dan disusun di atas meja konsol pada suatu sudut khas. Rajah 22 menunjukkan 5 pasu bunga yang berlainan. Cari bilangan susunan yang berlainan yang dapat dilakukan oleh Aini jika pasu bunga ros mesti berpisah di antara satu sama lain.*

[3marks]

[3markah]

Answer / Jawapan:

22



23. In an archery event, the probability of participant A and participant B hit the target is  $\frac{1}{3}$  and  $\frac{1}{4}$  respectively. Find the probability

*Dalam suatu acara memanah, kebarangkalian peserta A dan peserta B*

*memanah tepat ke sasaran ialah  $\frac{1}{3}$  dan  $\frac{1}{4}$  masing-masing.*

*Cari kebarangkalian bagi*

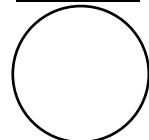
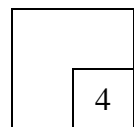
- (a) both players hit the target ,  
*kedua-dua peserta memanah tepat ke sasaran,*
- (b) only one participant hit the target.  
*hanya seorang peserta memanah tepat ke sasaran.*

[4 marks]  
[4 markah]

Answer / Jawapan:

- (a) (b)

23



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Pemeriksa

24. A set of number  $x_1, x_2, x_3, \dots, x_{12}$  has a standard deviation of  $\sqrt{54}$  and it is given that  $\sum x^2 = 3000$ . Find

*Suatu set nombor  $x_1, x_2, x_3, \dots, x_{12}$  mempunyai sisihan piawai  $\sqrt{54}$  dan diberi bahawa  $\sum x^2 = 3000$ . Cari*

(a) the value of  $\bar{x}$ ,  
*nilai  $\bar{x}$ ,*

(b) the new variance for  $\frac{x_1+3}{5}, \frac{x_2+3}{5}, \frac{x_3+3}{5}, \dots, \frac{x_{12}+3}{5}$ .

*varians baru untuk  $\frac{x_1+3}{5}, \frac{x_2+3}{5}, \frac{x_3+3}{5}, \dots, \frac{x_{12}+3}{5}$ .*

[3 marks]

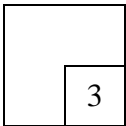
[3 markah]

Answer / Jawapan:

(a)

(b)

23



25. In a Science test, 35% of the students who sat for the test failed to obtain 50 marks. If 10 students are selected from those who sat for the test, find the probability that at least 8 of them obtain 50 marks and above.

*Dalam suatu ujian Sains, 35% daripada pelajar gagal mencapai 50 markah.*

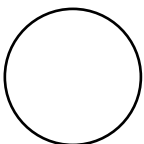
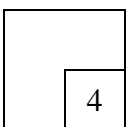
*Jika 10 orang pelajar dipilih, hitung kebarangkalian bahawa sekurang-kurangnya 8 orang mencapai 50 markah dan ke atas.*

[3 marks]

[3 markah]

Answer / Jawapan:

25



**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   |         |         |         |         |         |         |         |         |         | Minus / Tolak |   |   |    |    |    |    |    |    |    |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|---|---|----|----|----|----|----|----|----|
|     | 0       | 1       | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9             | 1 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 0.0 | 0.5000  | 0.4960  | 0.4920  | 0.4880  | 0.4840  | 0.4801  | 0.4761  | 0.4721  | 0.4681  | 0.4641        | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.1 | 0.4602  | 0.4562  | 0.4522  | 0.4483  | 0.4443  | 0.4404  | 0.4364  | 0.4325  | 0.4286  | 0.4247        | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
| 0.2 | 0.4207  | 0.4168  | 0.4129  | 0.4090  | 0.4052  | 0.4013  | 0.3974  | 0.3936  | 0.3897  | 0.3859        | 4 | 8 | 12 | 15 | 19 | 23 | 27 | 31 | 35 |
| 0.3 | 0.3821  | 0.3783  | 0.3745  | 0.3707  | 0.3669  | 0.3632  | 0.3594  | 0.3557  | 0.3520  | 0.3483        | 4 | 7 | 11 | 15 | 19 | 22 | 26 | 30 | 34 |
| 0.4 | 0.3446  | 0.3409  | 0.3372  | 0.3336  | 0.3300  | 0.3264  | 0.3228  | 0.3192  | 0.3156  | 0.3121        | 4 | 7 | 11 | 15 | 18 | 22 | 25 | 29 | 32 |
| 0.5 | 0.3085  | 0.3050  | 0.3015  | 0.2981  | 0.2946  | 0.2912  | 0.2877  | 0.2843  | 0.2810  | 0.2776        | 3 | 7 | 10 | 14 | 17 | 20 | 24 | 27 | 31 |
| 0.6 | 0.2743  | 0.2709  | 0.2676  | 0.2643  | 0.2611  | 0.2578  | 0.2546  | 0.2514  | 0.2483  | 0.2451        | 3 | 7 | 10 | 13 | 16 | 19 | 23 | 26 | 29 |
| 0.7 | 0.2420  | 0.2389  | 0.2358  | 0.2327  | 0.2296  | 0.2266  | 0.2236  | 0.2206  | 0.2177  | 0.2148        | 3 | 6 | 9  | 12 | 15 | 18 | 21 | 24 | 27 |
| 0.8 | 0.2119  | 0.2090  | 0.2061  | 0.2033  | 0.2005  | 0.1977  | 0.1949  | 0.1922  | 0.1894  | 0.1867        | 3 | 5 | 8  | 11 | 14 | 16 | 19 | 22 | 25 |
| 0.9 | 0.1841  | 0.1814  | 0.1788  | 0.1762  | 0.1736  | 0.1711  | 0.1685  | 0.1660  | 0.1635  | 0.1611        | 3 | 5 | 8  | 10 | 13 | 15 | 18 | 20 | 23 |
| 1.0 | 0.1587  | 0.1562  | 0.1539  | 0.1515  | 0.1492  | 0.1469  | 0.1446  | 0.1423  | 0.1401  | 0.1379        | 2 | 5 | 7  | 9  | 12 | 14 | 16 | 19 | 21 |
| 1.1 | 0.1357  | 0.1335  | 0.1314  | 0.1292  | 0.1271  | 0.1251  | 0.1230  | 0.1210  | 0.1190  | 0.1170        | 2 | 4 | 6  | 8  | 10 | 12 | 14 | 16 | 18 |
| 1.2 | 0.1151  | 0.1131  | 0.1112  | 0.1093  | 0.1075  | 0.1056  | 0.1038  | 0.1020  | 0.1003  | 0.0985        | 2 | 4 | 6  | 7  | 9  | 11 | 13 | 15 | 17 |
| 1.3 | 0.0968  | 0.0951  | 0.0934  | 0.0918  | 0.0901  | 0.0885  | 0.0869  | 0.0853  | 0.0838  | 0.0823        | 2 | 3 | 5  | 6  | 8  | 10 | 11 | 13 | 14 |
| 1.4 | 0.0808  | 0.0793  | 0.0778  | 0.0764  | 0.0749  | 0.0735  | 0.0721  | 0.0708  | 0.0694  | 0.0681        | 1 | 3 | 4  | 6  | 7  | 8  | 10 | 11 | 13 |
| 1.5 | 0.0668  | 0.0655  | 0.0643  | 0.0630  | 0.0618  | 0.0606  | 0.0594  | 0.0582  | 0.0571  | 0.0559        | 1 | 2 | 4  | 5  | 6  | 7  | 8  | 10 | 11 |
| 1.6 | 0.0548  | 0.0537  | 0.0526  | 0.0516  | 0.0505  | 0.0495  | 0.0485  | 0.0475  | 0.0465  | 0.0455        | 1 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 1.7 | 0.0446  | 0.0436  | 0.0427  | 0.0418  | 0.0409  | 0.0401  | 0.0392  | 0.0384  | 0.0375  | 0.0367        | 1 | 2 | 3  | 4  | 4  | 5  | 6  | 7  | 8  |
| 1.8 | 0.0359  | 0.0351  | 0.0344  | 0.0336  | 0.0329  | 0.0322  | 0.0314  | 0.0307  | 0.0301  | 0.0294        | 1 | 1 | 2  | 3  | 4  | 4  | 5  | 6  | 6  |
| 1.9 | 0.0287  | 0.0281  | 0.0274  | 0.0268  | 0.0262  | 0.0256  | 0.0250  | 0.0244  | 0.0239  | 0.0233        | 1 | 1 | 2  | 2  | 3  | 4  | 4  | 5  | 5  |
| 2.0 | 0.0228  | 0.0222  | 0.0217  | 0.0212  | 0.0207  | 0.0202  | 0.0197  | 0.0192  | 0.0188  | 0.0183        | 0 | 1 | 1  | 2  | 2  | 3  | 3  | 4  | 4  |
| 2.1 | 0.0179  | 0.0174  | 0.0170  | 0.0166  | 0.0162  | 0.0158  | 0.0154  | 0.0150  | 0.0146  | 0.0143        | 0 | 1 | 1  | 2  | 2  | 2  | 3  | 3  | 4  |
| 2.2 | 0.0139  | 0.0136  | 0.0132  | 0.0129  | 0.0125  | 0.0122  | 0.0119  | 0.0116  | 0.0113  | 0.0110        | 0 | 1 | 1  | 1  | 2  | 2  | 2  | 3  | 3  |
| 2.3 | 0.0107  | 0.0104  | 0.0102  |         |         |         |         |         |         |               | 0 | 1 | 1  | 1  | 1  | 2  | 2  | 2  | 2  |
|     |         |         |         | 0.00990 | 0.00964 | 0.00939 | 0.00914 |         |         |               | 3 | 5 | 8  | 10 | 13 | 15 | 18 | 20 | 23 |
|     |         |         |         |         |         |         |         | 0.00889 | 0.00866 | 0.00842       | 2 | 5 | 7  | 9  | 12 | 14 | 16 | 16 | 21 |
| 2.4 | 0.00820 | 0.00798 | 0.00776 | 0.00755 | 0.00734 |         |         |         |         |               | 2 | 4 | 6  | 8  | 11 | 13 | 15 | 17 | 19 |
|     |         |         |         |         |         | 0.00714 | 0.00695 | 0.00676 | 0.00657 | 0.00639       | 2 | 4 | 6  | 7  | 9  | 11 | 13 | 15 | 17 |
| 2.5 | 0.00621 | 0.00604 | 0.00587 | 0.00570 | 0.00554 | 0.00539 | 0.00523 | 0.00508 | 0.00494 | 0.00480       | 2 | 3 | 5  | 6  | 8  | 9  | 11 | 12 | 14 |
| 2.6 | 0.00466 | 0.00453 | 0.00440 | 0.00427 | 0.00415 | 0.00402 | 0.00391 | 0.00379 | 0.00368 | 0.00357       | 1 | 2 | 3  | 5  | 6  | 7  | 9  | 9  | 10 |
| 2.7 | 0.00347 | 0.00336 | 0.00326 | 0.00317 | 0.00307 | 0.00298 | 0.00289 | 0.00280 | 0.00272 | 0.00264       | 1 | 2 | 3  | 4  | 5  | 6  | 7  | 8  | 9  |
| 2.8 | 0.00256 | 0.00248 | 0.00240 | 0.00233 | 0.00226 | 0.00219 | 0.00212 | 0.00205 | 0.00199 | 0.00193       | 1 | 1 | 2  | 3  | 4  | 4  | 5  | 6  | 6  |
| 2.9 | 0.00187 | 0.00181 | 0.00175 | 0.00169 | 0.00164 | 0.00159 | 0.00154 | 0.00149 | 0.00144 | 0.00139       | 0 | 1 | 1  | 2  | 2  | 3  | 3  | 4  | 4  |
| 3.0 | 0.00135 | 0.00131 | 0.00126 | 0.00122 | 0.00118 | 0.00114 | 0.00111 | 0.00107 | 0.00104 | 0.00100       | 0 | 1 | 1  | 2  | 2  | 2  | 3  | 3  | 4  |

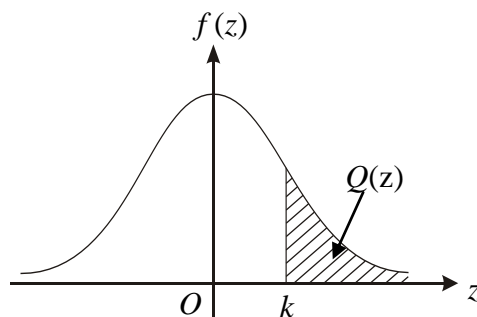
For negative  $z$  use relation :

Bagi  $z$  negative 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  $X \sim N(0, 1)$ , 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 spaces provided in this question paper.  
*Tulis jawapan anda pada 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 pages 2 to 4.  
*Satu senarai rumus disediakan di halaman 2 hingga 4.*
9. The Upper Tail Probability  $Q(z)$  For the Normal Distribution  $N(0, 1)$  Table is provided on page 23.  
*Jadual Kebarangkalian Hujung Atas  $Q(z)$  Bagi Taburan Normal  $N(0, 1)$  disediakan di halaman 23.*
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 pada akhir peperiksaan.*