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|---------------|--|
| NAMA: | |
| KELAS: | |

JABATAN PENDIDIKAN NEGERI SABAH
KEMENTERIAN PENDIDIKAN MALAYSIA

PEPERIKSAAN PERCUBAAN SPM 2023

MATEMATIK TAMBAHAN

3472/1

Kertas 1

2 jam

JANGAN BUKA KERTAS PEPERIKSAAN INI SEHINGGA DIBERITAHU

1. Kertas peperiksaan ini mengandungi **dua** bahagian: **Bahagian A**, dan **Bahagian B**.
2. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
3. Kertas peperiksaan ini adalah dalam dwibahasa.
4. Jawapan boleh ditulis dalam Bahasa Melayu atau bahasa Inggeris.
5. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
6. Kerja mengira anda mesti ditunjukkan.
7. Jadual Kebarangkalian Hujung Atas $Q(z)$ Bagi Taburan Normal $N(0,1)$ disediakan pada halaman **4**.
8. **Kertas peperiksaan** ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

Kertas peperiksaan ini mengandungi **22** halaman bercetak.

RUMUS
FORMULAE

| | | | |
|----|---|----|---|
| 1 | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ | 18 | Isi padu kisaran <i>Volume of revolution</i> $= \int_a^b \pi y^2 dx$ atau (or) $= \int_a^b \pi x^2 dy$ |
| 2 | $a^m \times a^n = a^{m+n}$ | | |
| 3 | $(a^m)^n = a^{mn}$ | | |
| 4 | $a^{\frac{m}{n}} = (a^m)^{\frac{1}{n}} = (a^{\frac{1}{n}})^m$ | 19 | $I = \frac{Q_1}{Q_2} \times 100$ |
| 5 | $\log_a mn = \log_a m + \log_a n$ | 20 | $\bar{I} = \frac{\sum W_i I_i}{\sum W_i}$ |
| 6 | $\log_a \frac{m}{n} = \log_a m - \log_a n$ | 21 | ${}^n P_r = \frac{n!}{(n-r)!}$ |
| 7 | $\log_a m^n = n \log_a m$ | 22 | ${}^n C_r = \frac{n!}{(n-r)! r!}$ |
| 8 | $\log_a b = \frac{\log_c b}{\log_c a}$ | 23 | $P(X = r) = {}^n C_r p^r q^{n-r}, p + q = 1$ |
| 9 | $T_n = a + (n - 1)d$ | 24 | Min / Mean, $\mu = np$ |
| 10 | $S_n = \frac{n}{2} [2a + (n - 1)d]$ | 25 | $\sigma = \sqrt{npq}$ |
| 11 | $T_n = ar^{n-1}$ | 26 | $Z = \frac{x - \mu}{\sigma}$ |
| 12 | $S_n = \frac{a(r^n - 1)}{1 - r} = \frac{a(1 - r^n)}{1 - r}, r \neq 1$ | 27 | Panjang lengkok, $s = j\theta$ <i>Arc length, $s = r\theta$</i> |
| 13 | $S_\infty = \frac{a}{r-1}, r < 1$ | 28 | Luas sektor, $L = \frac{1}{2} j^2 \theta$ <i>Area of sector, $L = \frac{1}{2} r^2 \theta$</i> |
| 14 | $y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$ | 29 | $\sin^2 A + \cos^2 A = 1$ $\sin^2 A + \cos^2 A = 1$ |
| 15 | $y = \frac{u}{v} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$ | 30 | $\sec^2 A = 1 + \tan^2 A$ $\sec^2 A = 1 + \tan^2 A$ |
| 16 | $\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$ | 31 | $\operatorname{cosec}^2 A = 1 + \cot^2 A$ $\operatorname{cosec}^2 A = 1 + \cot^2 A$ |
| 17 | Luas di bawah lengkung <i>Area under a curve</i> $= \int_a^b y dx$ atau (or) $= \int_a^b x dy$ | | |

(Edited Nov2023)

$$32 \quad \sin 2A = 2 \sin A \cos A$$

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

$$33 \quad \cos 2A = \cos^2 A - \sin^2 A$$

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

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

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

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

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

$$34 \quad \tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

$$35 \quad \sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

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

$$36 \quad \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

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

$$37 \quad \tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

$$38 \quad \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$39 \quad a^2 = b^2 + c^2 - 2bc \cos A$$

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

40 Luas segi tiga/Area of triangle

$$= \frac{1}{2} ab \sin C$$

41 Titik yang membahagi suatu tembereng garis

A point dividing a segment of a line

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

42 Luas segi tiga/Area of triangle

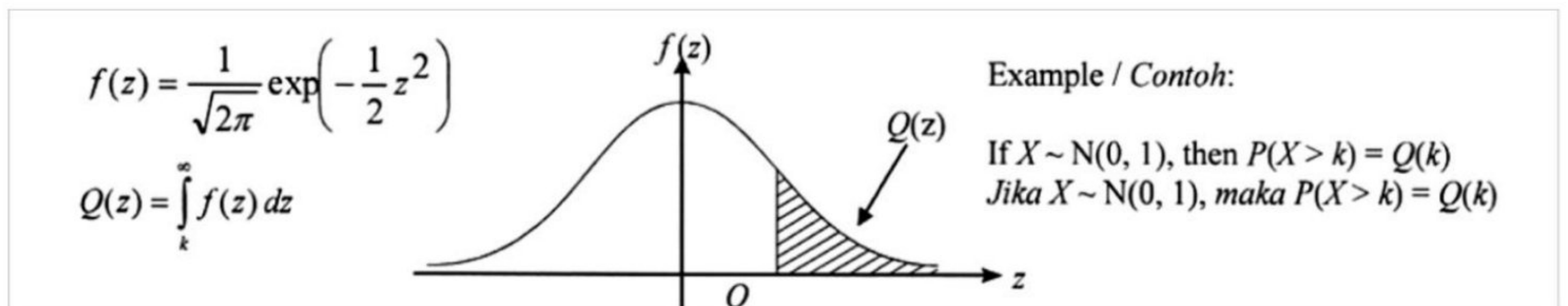
$$= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - (x_2 y_1 + x_3 y_2 + x_1 y_3)|$$

$$43 \quad |\underline{r}| = \sqrt{x^2 + y^2}$$

$$44 \quad \hat{r} = \frac{x\mathbf{i} + y\mathbf{j}}{\sqrt{x^2 + y^2}}$$

THE UPPER TAIL PROBABILITY $Q(z)$ FOR THE NORMAL DISTRIBUTION $N(0, 1)$
KEBARANGKALIAN Hujung Atas $Q(z)$ BAGI TABURAN NORMAL $N(0, 1)$

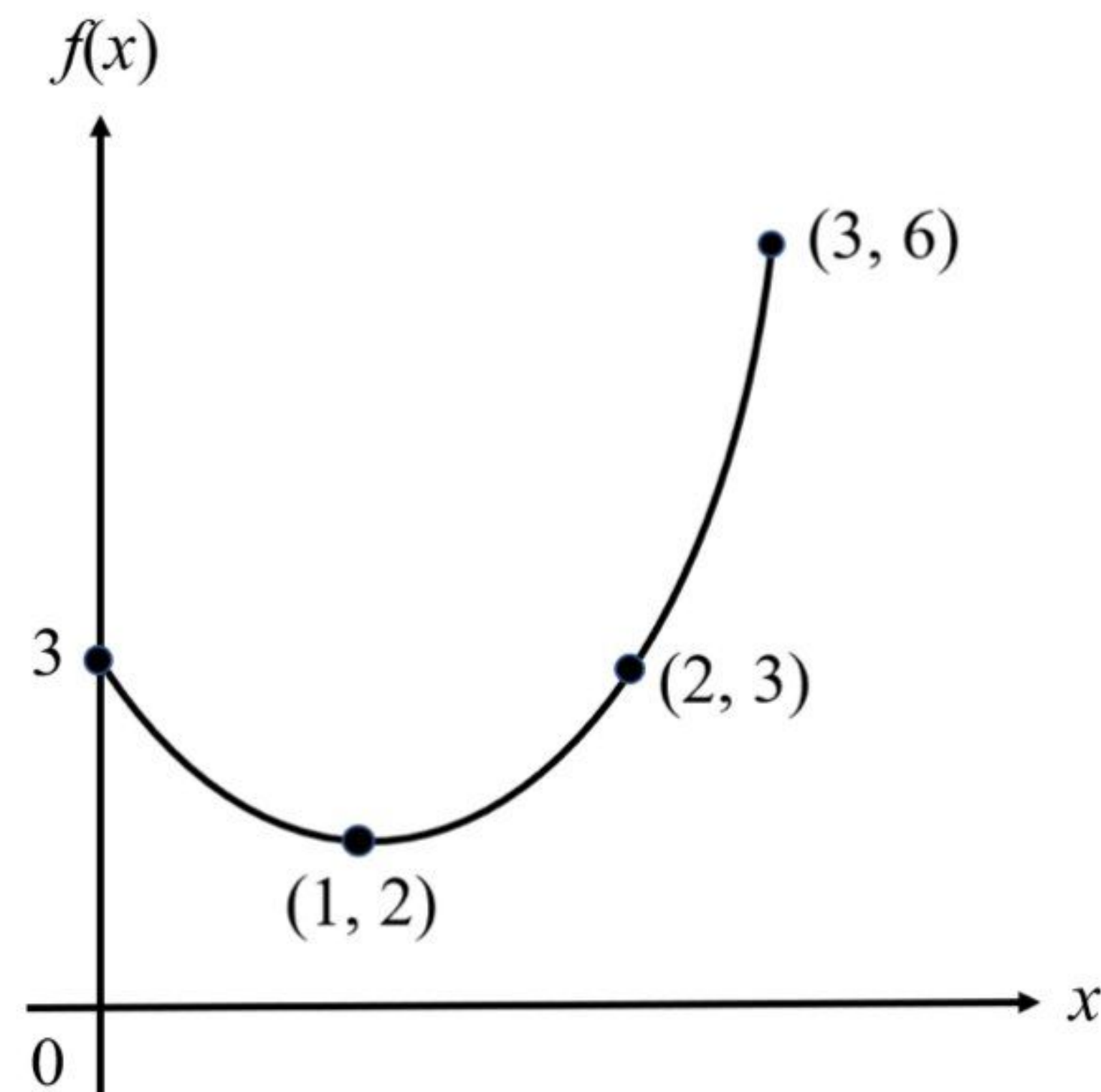
| z | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Minus / Tolak | | | | | | | | |
|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|---|----|----|----|----|----|----|----|
| | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 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 | | 0.00990 | 0.00964 | 0.00939 | 0.00914 | | | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| | | | | | | | | | | | 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 |



Bahagian A
[64 markah]
Jawab SEMUA soalan di bahagian ini.

1. Rajah 1 menunjukkan suatu fungsi $f(x)$ yang tertakrif dalam domain tertentu.

Diagram 1 shows a function of $f(x)$ defined in a certain domain.



Rajah 1/Diagram 1

- a) Nyatakan jenis hubungan fungsi ini.
State the type of relation of this function.
- b) Nyatakan domain dan julat bagi fungsi ini.
State the domain and range of this function.

[1 markah/mark]

[2 markah/marks]

Jawapan/Answer:

a)

b)

2. a) Permudahkan $-\log_m a - \log_m b - \log_m c$ sebagai sebutan tunggal.

Simplify $-\log_m a - \log_m b - \log_m c$ as a single term.

[1 markah/mark]

- b) Diberi $49m^5n^c = \frac{2401 m^{10} n^4 \times m^b n^2}{am^7n}$. Cari nilai bagi a , b dan c .

Given $49m^5n^c = \frac{2401 m^{10} n^4 \times m^b n^2}{am^7n}$. Find the values of a , b and c .

[3 markah/marks]

Jawapan/Answer:

a)

b)

3. a) Selesaikan persamaan $e^{3x+2} = 10$.

Solve the equation $e^{3x+2} = 10$.

[2 markah/marks]

b) Selesaikan persamaan

Solve the equation

$$\frac{\log_3(6+5x)}{\log_9(2+x)} = 4$$

[4 markah/marks]

Jawapan/Answer:

a)

b)

(Edited Nov2023)

4. Suatu lengkung mempunyai fungsi kecerunan $4x^3 - px$, dengan keadaan p ialah pemalar. Tangen kepada lengkung pada titik $(2, 5)$ berserenjang dengan garis lurus $x + 8y = 1$. Carikan

A curve has a gradient function of $4x^3 - px$, where p is a constant. The tangent to the curve at point $(2, 5)$ is perpendicular to the line $x + 8y = 1$. Find

- a) nilai p , / *the value of p ,*

[3 markah/marks]

- b) persamaan lengkung itu. / *the equation of the curve.*

[3 markah/marks]

Jawapan/Answer:

- a)

- b)

(Edited Nov2023)

5. Diberi titik $P(1, p - 1)$ dan $R(9, 8)$, cari nilai/nilai-nilai p yang mungkin bagi setiap kes berikut.

Given the points $P(1, p - 1)$ and $R(9, 8)$, find the possible value/values of p for each of the following case.

a) \vec{OP} dan \vec{OR} adalah selari.

\vec{OP} and \vec{OR} are parallel.

[2 markah/marks]

b) $|\vec{OP}| = |\vec{OR}|$.

[2 markah/marks]

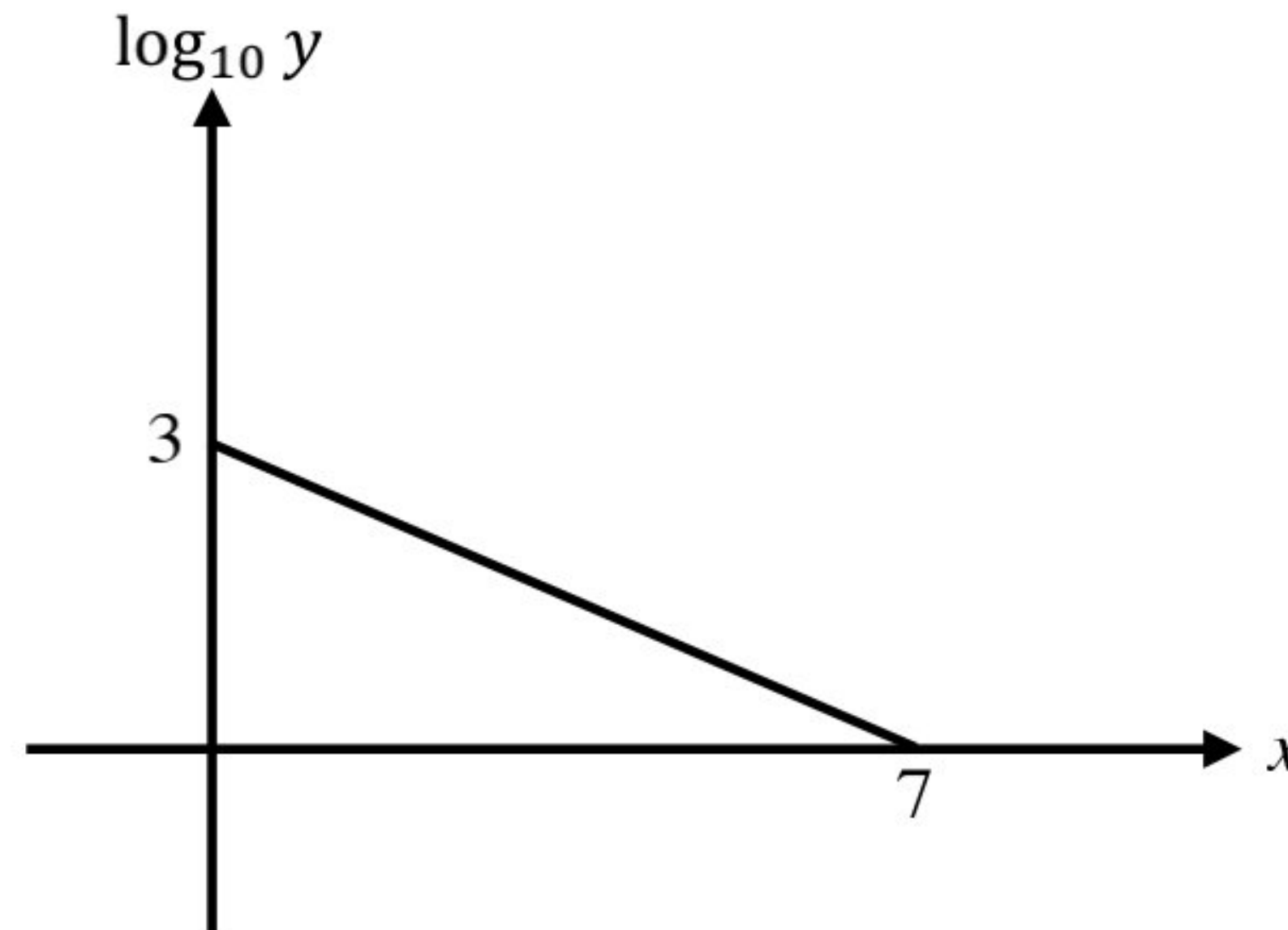
Jawapan/Answer:

a)

b)

6. a) Pemboleh ubah x dan y adalah dihubungkan dengan persamaan $y = pq^x$ di mana p dan q adalah pemalar.

The variables x and y are related by the equation $y = pq^x$, where p and q are constants.



Rajah 6/Diagram 6

Rajah 6 menunjukkan graf garis lurus yang diperolehi dengan melukis $\log_{10}y$ kepada x . Cari nilai p dan q .

Diagram 6 shows the straight line obtained by plotting $\log_{10}y$ against x . Find the values of p and of q .

[3 markah/marks]

- b) Pemboleh ubah x dan y adalah dihubungi dengan persamaan $y = ax^b$ di mana a dan b adalah pemalar yang tak diketahui. Terangkan bagaimana nilai-nilai a dan b boleh ditentukan daripada satu graf garis lurus yang sesuai.

The variables x and y are related by the equation $y = ax^b$, where a and b are unknown constants. Explain, how the a and b can be obtained.

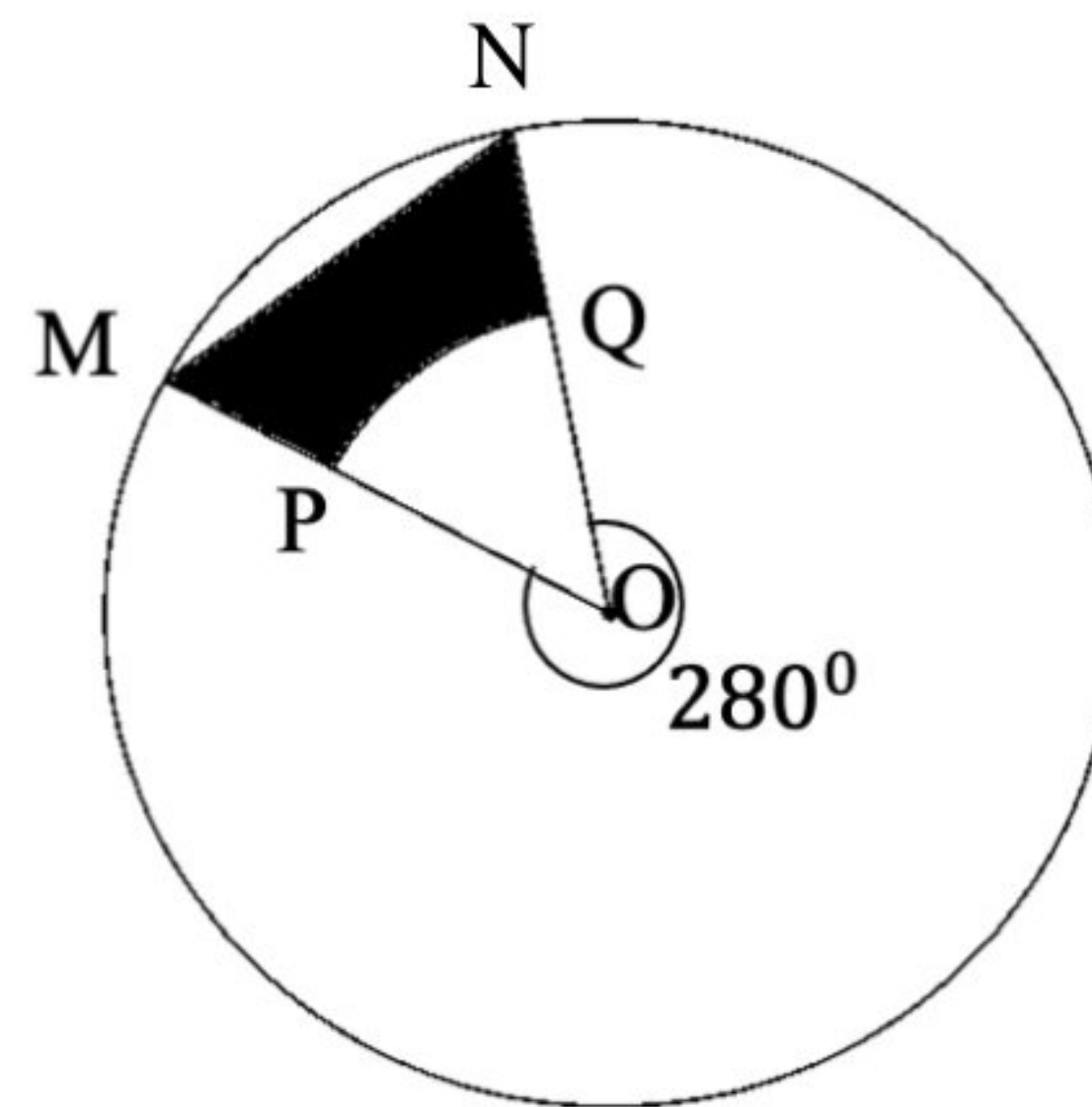
[1 markah/mark]

Jawapan/Answer:

a)

b)

7. Rajah 7 menunjukkan sektor POQ dan segi tiga MON terterap dalam sebuah bulatan dengan pusat O .
Diagram 7 shows sector POQ and MON inscribed in a circle with centre O .



Rajah 7/Diagram 7

Jejari bulatan dan jejari sektor POQ masing-masing ialah x cm dan y cm. Diberi bahawa perimeter sektor minor MON ialah 33.97 cm dan luas kawasan berlorek ialah 15.03 cm².

The radius of the circle and the radius of the sector POQ is x cm and y cm respectively. Given that the perimeter of the minor sector MON is 33.97 cm and the area of the shaded region is 15.03 cm².

[Guna/Use $\pi = 3.142$]

- a) Nyatakan $\angle MON$, dalam unit radian.

State $\angle MON$, in radian.

[1 markah/mark]

- b) Seterusnya, hitung nilai x dan nilai y kepada integer terdekat.

Hence, calculate the value of x and of y to the nearest integer.

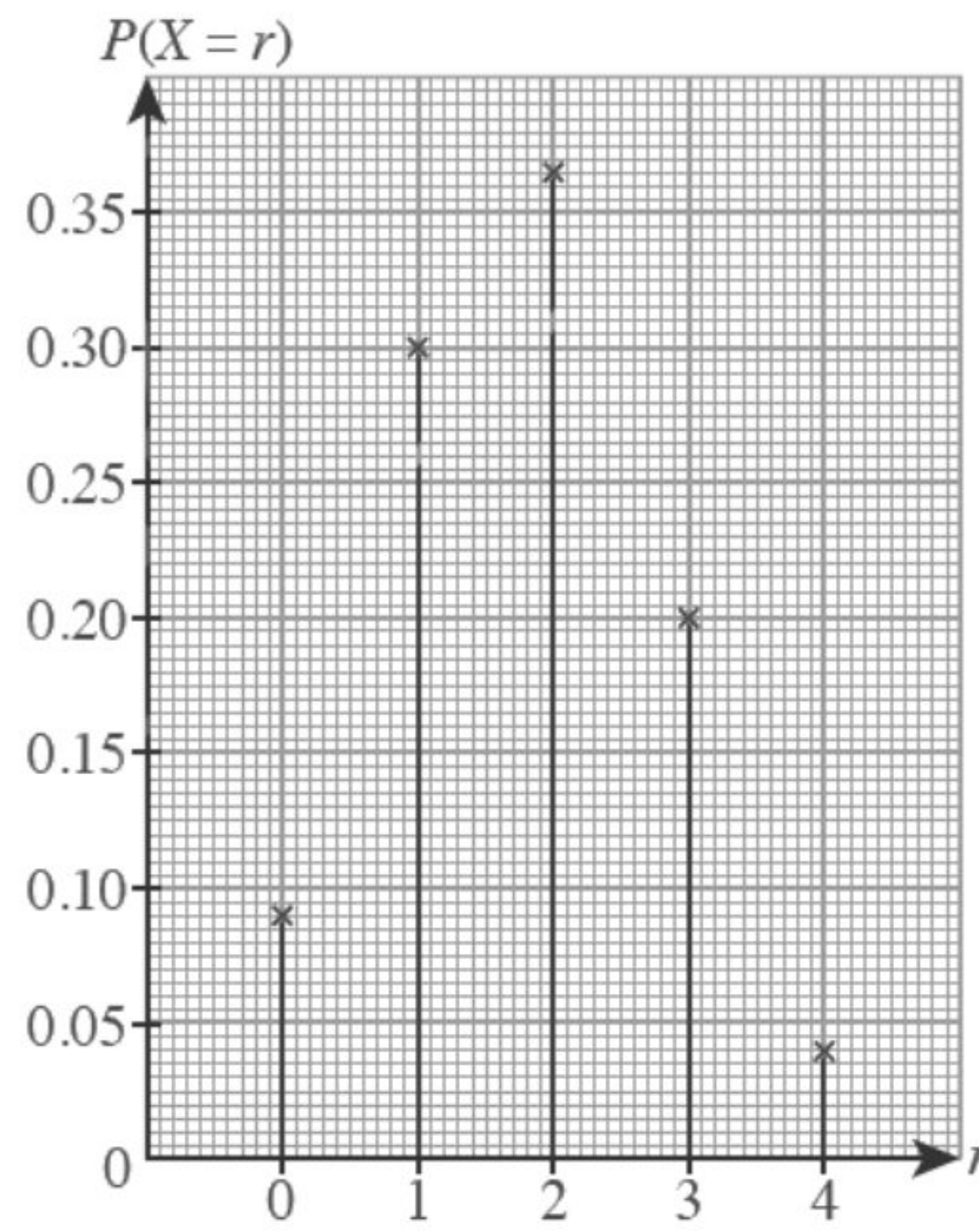
[6 markah/marks]

Jawapan/Answer:

a)

b)

8. Rajah 8 menunjukkan graf bagi suatu taburan binomial $X \sim B(n, p)$.
Diagram 8 shows the graph of a binomial distribution $X \sim B(n, p)$.



Rajah 8/Diagram 8

- a) Senaraikan pemboleh ubah rawak diskrit, X bagi taburan itu.
List down all the discrete random variable, X for the distribution.

[1 markah /mark]

- b) Diberi $P(X \leq 3) = 0.959$, cari
Given that $P(X \leq 3) = 0.959$, find
- (i) nilai p ,
the value of p ,
 - (ii) min dan varians bagi taburan itu.
mean and variance for the distribution.

[6 markah/marks]

Jawapan/Answer:

- a)

Jawapan/Answer :Soalan/Question 8

b) i)

ii)

9. Diberi $X \sim N(45, 90.25)$, cari nilai k jika $P(40 < X < k) = 0.1025$.

Given that $X \sim N(45, 90.25)$, find the value of k if $P(40 < X < k) = 0.1025$.

[3 markah/marks]

Jawapan/Answer:

10. Satu jawatankuasa yang terdiri daripada Pengerusi, Timbalan Pengerusi, Setiausaha, Bendahari dan 6 orang Ahli Jawatankuasa (AJK) akan dilantik daripada 12 orang calon, 7 lelaki dan 5 perempuan.

A committee consisting of Chairman, Deputy Chairman, Secretary, Treasurer and 6 Committee members will be appointed from 12 candidates, 7 men and 5 women.

- a) Berapakah bilangan cara jawatankuasa yang berbeza dapat dibentuk jika

How many different ways can a committee be formed if

- (i) tiada syarat yang perlu dipatuhi,

there are no conditions to be complied with,

- (ii) Pengerusi dan Timbalan mesti lelaki manakala Setiausaha dan Bendahari mesti perempuan?

Chairman dan Deputy must be male, Secretary and Treasurer must be female?

[4 markah/marks]

- b) Semua jawatankuasa yang dilantik ini akan hadir ke majlis makan malam dan perlu duduk di satu meja bulat dengan 10 kerusi. Hitungkan bilangan cara mereka boleh disusun jika Pengerusi dan Timbalan Pengerusi mesti duduk sebelah menyebelah.

All appointed committees will attend the dinner and need to sit at a round table with 10 chairs.

Calculate the number of ways they can be arranged if the Chairman and Deputy Chairman must sit side by side.

[2 markah/marks]

Jawapan/Answer:

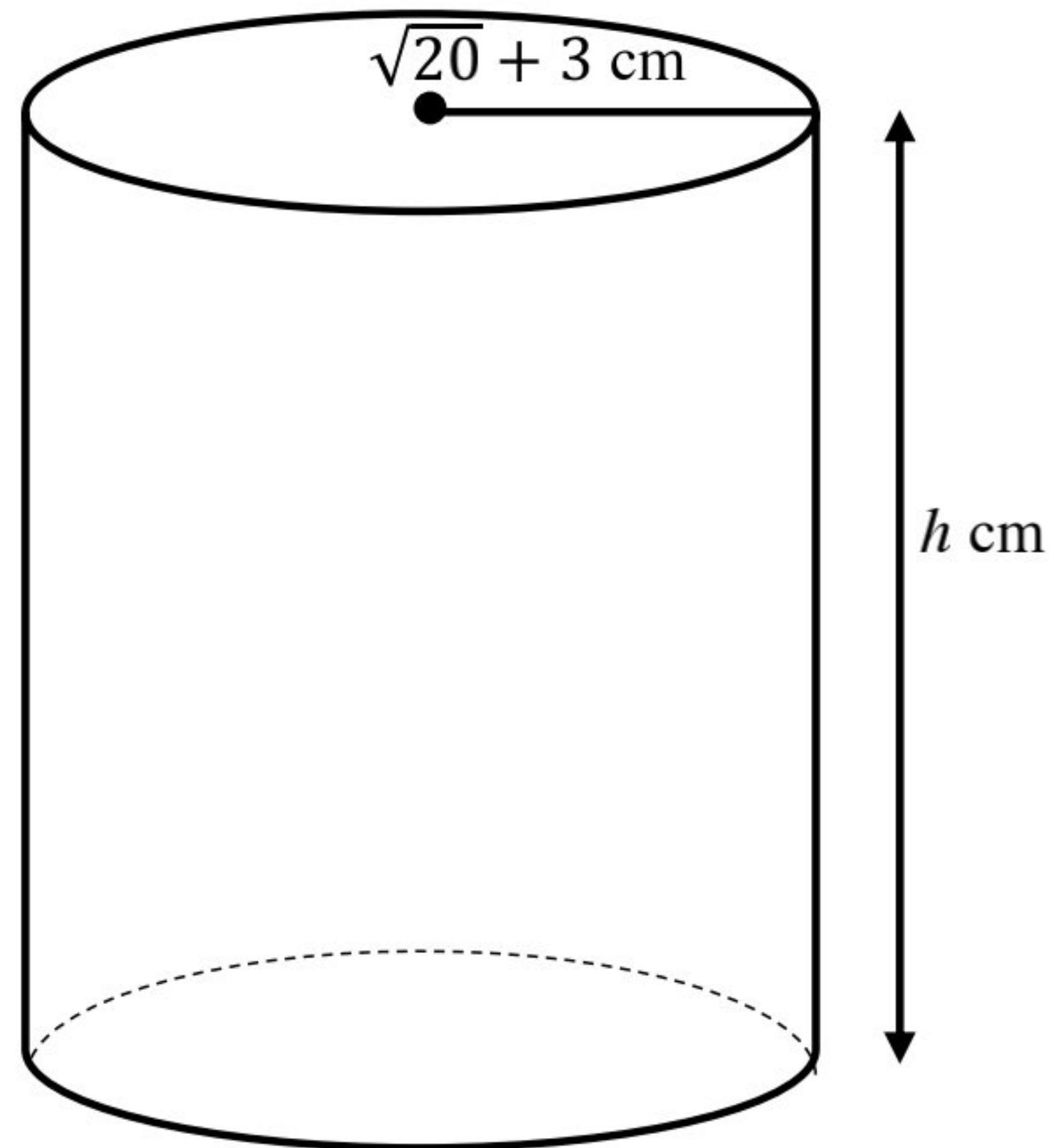
- a) i)

- ii)

- b)

11. Rajah 11 menunjukkan sebuah silinder berisipadu $(23 - 3\sqrt{5})\pi \text{ cm}^3$. Jejari silinder itu ialah $(\sqrt{20} + 3) \text{ cm}$. Cari tinggi silinder, h dan beri jawapan anda dalam bentuk $a + b\sqrt{c}$, dengan keadaan a , b dan c ialah integer.

Diagram 11 shows a cylinder with a volume of $(23 - 3\sqrt{5})\pi \text{ cm}^3$. The radius of the cylinder is $(\sqrt{20} + 3) \text{ cm}$. Find the height of the cylinder, h and give your answer in the form $a + b\sqrt{c}$, where a , b and c are integers.



Rajah 11/Diagram 11

[5 markah/marks]

Jawapan/Answer:

12. a) Jika a ialah sebutan pertama dan d ialah beza sepunya bagi suatu jangjang aritmetik, tunjukkan bahawa hasil tambah n sebutan pertama bagi jangjang itu ialah $S_n = \frac{n}{2}[2a + (n - 1)d]$.

If a is the first term and d is the common difference of an arithmetic progression, shows that the sum of the first n terms of the progression is $S_n = \frac{n}{2}[2a + (n - 1)d]$.

[3 markah/marks]

- b) Diberi suatu jangjang aritmetik 5, 9, 13, 17, cari hasil tambah n sebutan pertama.

Given an arithmetic progression 5, 9, 13, 17, ... find the sum of the first n terms.

[2 markah/marks]

- c) Seterusnya, selesaikan persamaan

Hence, solve the equation

$$5 + 9 + 13 + 17 + \dots + x = 2277$$

[4 markah/marks]

Jawapan/Answer:

a)

b)

c)

Bahagian B
[16 markah]

Jawab DUA soalan sahaja dari bahagian ini.

13. a) Diberi bahawa $\cos(\alpha + \beta) = \frac{1}{4}$ dan $\sin \alpha \sin \beta = \frac{1}{2}$. Cari nilai setiap yang berikut:

Given that $\cos(\alpha + \beta) = \frac{1}{4}$ and $\sin \alpha \sin \beta = \frac{1}{2}$. Find the value of each of the following:

i) $\cos \alpha \cos \beta$,

$\cos \alpha \cos \beta$,

ii) $\cos(\alpha - \beta)$.

$\cos(\alpha - \beta)$.

[4 markah/marks]

- b) Selesaikan persamaan $4 \sin \theta = \sqrt{2} \sec \theta$ bagi semua sudut antara 0° dengan 360° .

Solve the equation $4 \sin \theta = \sqrt{2} \sec \theta$ for all the angles between 0° and 360° .

[3 markah/marks]

- c) Pada ruang jawapan di bawah, labelkan sudut $(180^\circ - p)$, jika sudut rujukan ialah p .

In the answer space below, label the angle $(180^\circ - p)$, if the reference angle is p .

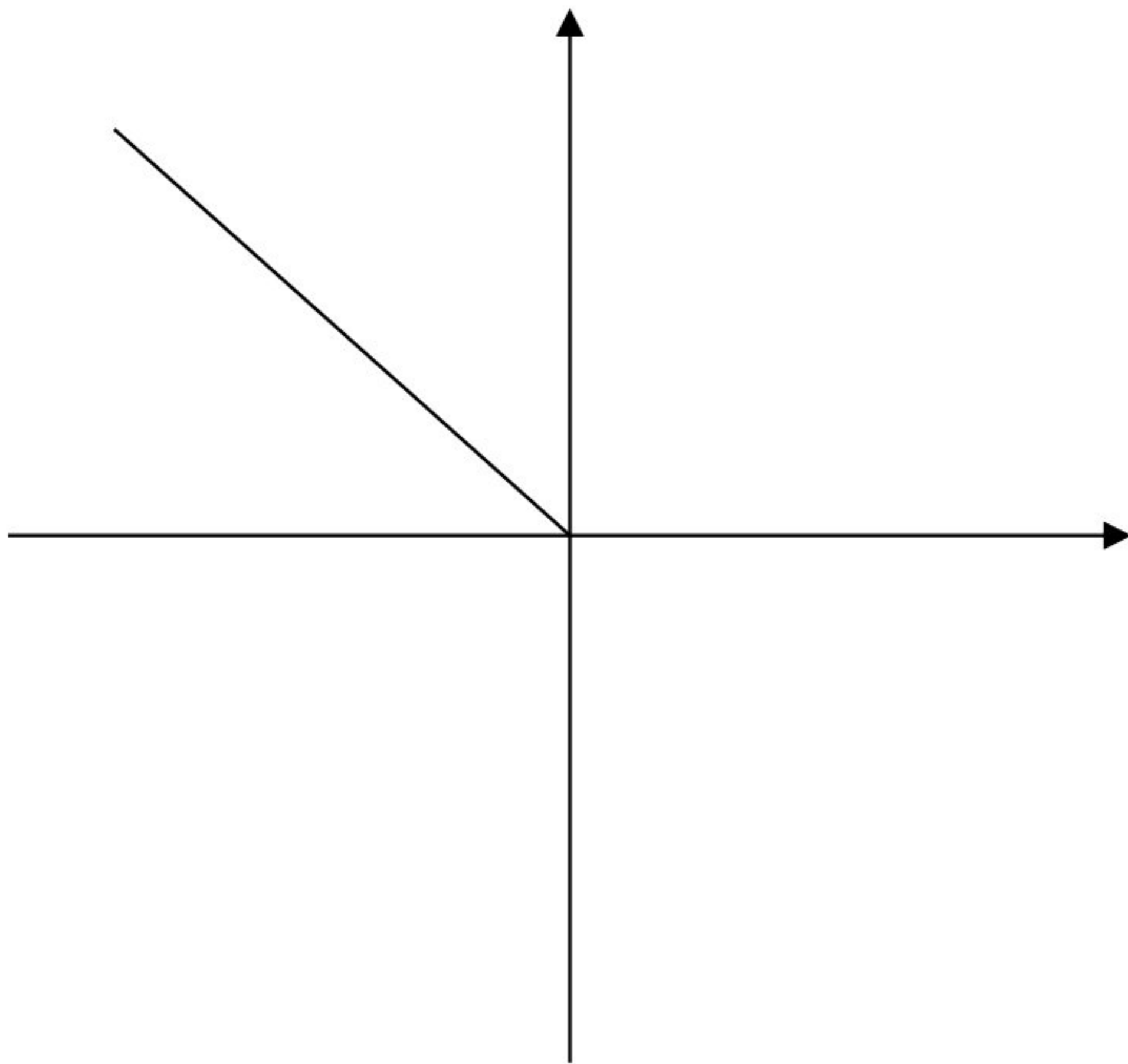
[1 markah/mark]

Jawapan/Answer:

a)

b)

c)



14. a) Diberi bahawa garis lurus $y = 0$ merupakan garis tangen kepada lengkung $f(x) = 2x^2 + (h-1)x + 2k^2$, dengan keadaan h dan k adalah pemalar.

Given that the straight line $y = 0$ is the tangent line to the curve $f(x) = 2x^2 + (h-1)x + 2k^2$, where h and k are constants.

Ungkapkan h dalam sebutan k .

Express h in terms of k .

[2 markah/marks]

- b) Diberi bahawa fungsi kuadratik $f(x) = -2x^2 + 4x + 30$ ditakrifkan dalam domain $-3 \leq x \leq 7$.

Given that the quadratic function $f(x) = -2x^2 + 4x + 30$ is defined in the domain $-3 \leq x \leq 7$.

- (i) Dengan menggunakan kaedah penyempurnaan kuasa dua, ungkapkan $f(x)$ dalam bentuk verteks, dan nyatakan koordinat titik pusingan bagi $f(x)$.

By using completing the square method, express $f(x)$ in the vertex form and state the turning point of $f(x)$.

- (ii) Ungkapkan $f(x)$ dalam bentuk pintasan, dan seterusnya, lakarkan graf bagi $f(x)$.

Express $f(x)$ in the intercept form, and hence, sketch the graph of $f(x)$.

[6 markah/marks]

Jawapan/Answer:

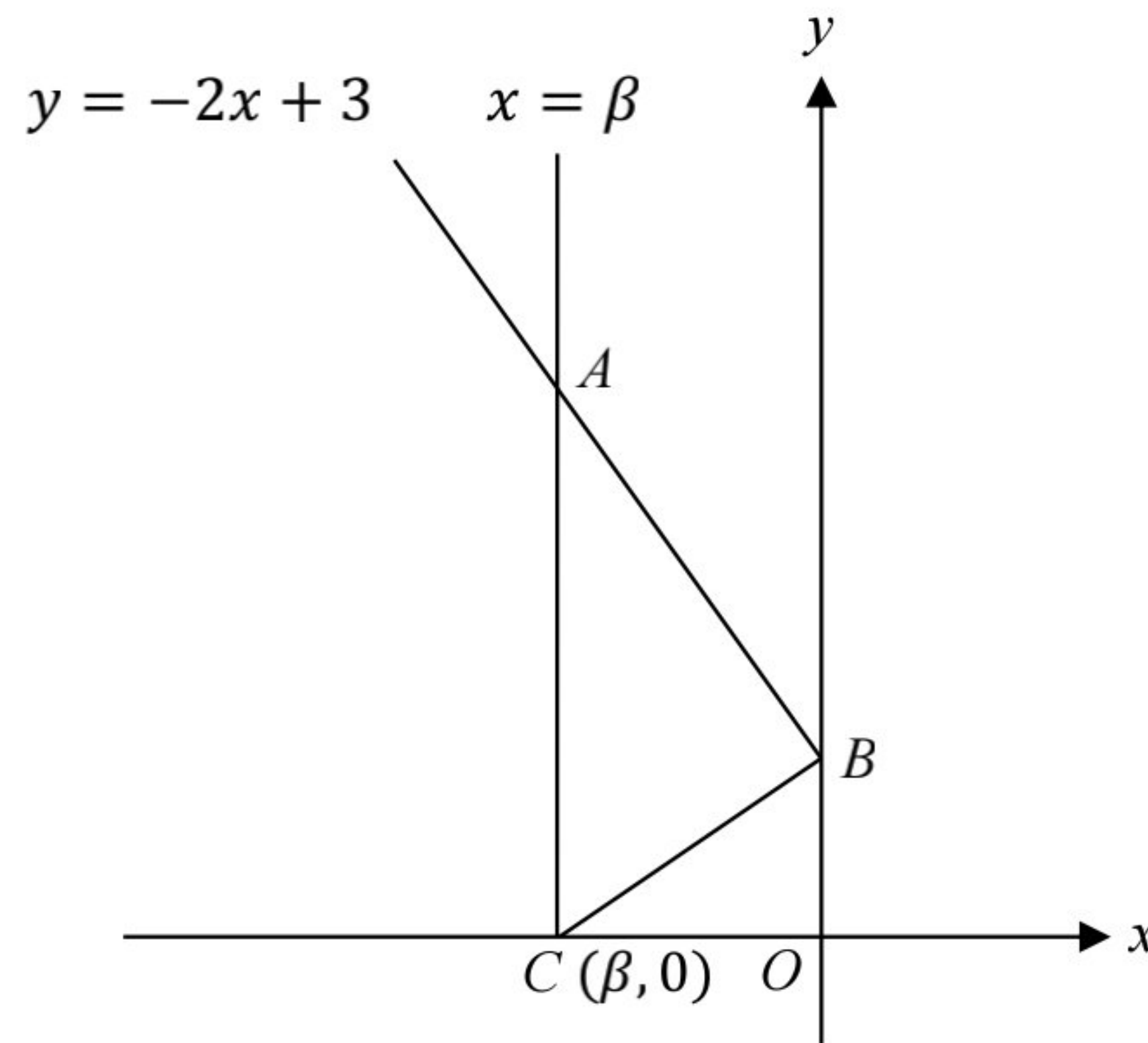
a)

b) i)

ii)

15. Rajah 15 menunjukkan garis lurus $y = -2x + 3$ menyilang garis $x = \beta$ di A dan menyilang paksi- y di B .

Diagram 15 shows a straight line $y = -2x + 3$ intersects line $x = \beta$ at A and intersects y -axis at B .



Rajah 15/Diagram 15

Diberi bahawa koordinat C ialah $(\beta, 0)$ dan $\angle ABC = 90^\circ$, cari

Given that coordinate of C is $(\beta, 0)$ and $\angle ABC = 90^\circ$, find

- a) nilai β ,
the value of β ,

[2 markah/marks]

- b) koordinat A ,
the coordinate of A ,

[1 markah/mark]

- c) luas segi tiga ABC ,
the area of triangle ABC ,

[2 markah/marks]

- d) persamaan lokus bagi S jika titik S bergerak dengan keadaan jaraknya dari titik B sentiasa sama dengan jarak antara titik B dan titik C .

the equation of the locus S if the point S moves such that its distance from point B is always the same as the distance between point B and point C .

[3 markah/marks]

Jawapan/*Answer*:

a)

b)

c)

d)

KERTAS SOALAN TAMAT