

Nama: .....

Kelas: .....

**PEPERIKSAAN PERCUBAAN SPM 2026**

**MATEMATIK TAMBAHAN TINGKATAN 5**

**3472/1**

**Kertas 1**

Ogos 2026

2 jam

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**JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU**

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1. Tulis **nama** dan **kelas** anda pada ruang yang disediakan.
2. Kertas peperiksaan ini mengandungi **dua** bahagian: **Bahagian A** dan **Bahagian B**.
3. Jawapan hendaklah ditulis pada ruang jawapan yang disediakan di dalam kertas peperiksaan ini.
4. Kertas peperiksaan ini adalah dalam dwibahasa.
5. Jawapan boleh ditulis dalam bahasa Melayu atau bahasa Inggeris.
6. Rajah yang mengiringi soalan tidak dilukis mengikut skala kecuali dinyatakan.
7. Kerja mengira **mesti** ditunjukkan.
8. **Kertas peperiksaan** ini hendaklah diserahkan kepada pengawas peperiksaan pada akhir peperiksaan.

| SOALAN                               | MARKAH<br>PENUH | MARKAH<br>DIPEROLEH |
|--------------------------------------|-----------------|---------------------|
| <b>BAHAGIAN A</b>                    |                 |                     |
| 1                                    | 2               |                     |
| 2                                    | 4               |                     |
| 3                                    | 8               |                     |
| 4                                    | 4               |                     |
| 5                                    | 7               |                     |
| 6                                    | 6               |                     |
| 7                                    | 6               |                     |
| 8                                    | 6               |                     |
| 9                                    | 5               |                     |
| 10                                   | 5               |                     |
| 11                                   | 7               |                     |
| 12                                   | 4               |                     |
| <b>JUMLAH</b>                        | <b>64</b>       |                     |
| <b>BAHAGIAN B</b>                    |                 |                     |
| 13                                   | 8               |                     |
| 14                                   | 8               |                     |
| 15                                   | 8               |                     |
| <b>JUMLAH</b>                        | <b>16</b>       |                     |
| <b>JUMLAH KESELURUHAN<br/>MARKAH</b> |                 |                     |

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

- |    |                                                                                                         |    |                                                                                                                 |
|----|---------------------------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------|
| 1  | $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$                                                                | 18 | Isi padu kisanan<br><i>Volume of revolution</i><br>$= \int_a^b \pi y^2 dx$ atau (or)<br>$= \int_a^b \pi x^2 dy$ |
| 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  | $\log_a mn = \log_a m + \log_a n$                                                                       | 19 | $I = \frac{Q_1}{Q_0} \times 100$                                                                                |
| 6  | $\log_a \frac{m}{n} = \log_a m - \log_a n$                                                              | 20 | $\bar{I} = \frac{\sum I_i W_i}{\sum W_i}$                                                                       |
| 7  | $\log_a m^n = n \log_a m$                                                                               | 21 | ${}^n P_r = \frac{n!}{(n-r)!}$                                                                                  |
| 8  | $\log_a b = \frac{\log_c b}{\log_c a}$                                                                  | 22 | ${}^n C_r = \frac{n!}{(n-r)!r!}$                                                                                |
| 9  | $T_n = a + (n-1)d$                                                                                      | 23 | $P(X=r) = {}^n C_r p^r q^{n-r}, p+q=1$                                                                          |
| 10 | $S_n = \frac{n}{2} [2a + (n-1)d]$                                                                       | 24 | Min / Mean, $\mu = np$                                                                                          |
| 11 | $T_n = ar^{n-1}$                                                                                        | 25 | $\sigma = \sqrt{npq}$                                                                                           |
| 12 | $S_n = \frac{a(1-r^n)}{1-r} = \frac{a(r^n-1)}{r-1}, r \neq 1$                                           | 26 | $z = \frac{x-\mu}{\sigma}$                                                                                      |
| 13 | $S_\infty = \frac{a}{1-r},  r  < 1$                                                                     | 27 | Panjang lengkok, $s = j\theta$<br><i>Arc length, <math>s = r\theta</math></i>                                   |
| 14 | $y = uv, \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$                                             | 28 | Luas sektor, $L = \frac{1}{2} j^2 \theta$<br><i>Area of sector, <math>A = \frac{1}{2} r^2 \theta</math></i>     |
| 15 | $y = \frac{u}{v}, \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$                        | 29 | $\sin^2 A + \cos^2 A = 1$<br>$\sin^2 A + \cos^2 A = 1$                                                          |
| 16 | $\frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$                                                    | 30 | $\sec^2 A = 1 + \tan^2 A$<br>$\sec^2 A = 1 + \tan^2 A$                                                          |
| 17 | Luas di bawah lengkung<br><i>Area under a curve</i><br>$= \int_a^b y dx$ atau (or)<br>$= \int_a^b x dy$ | 31 | $\operatorname{cosec}^2 A = 1 + \cot^2 A$<br>$\operatorname{cosec}^2 A = 1 + \cot^2 A$                          |

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

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

$$33 \quad \begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \\ \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

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

$$35 \quad \begin{aligned} \sin(A \pm B) &= \sin A \cos B \pm \cos A \sin B \\ \sin(A \pm B) &= \sin A \cos B \pm \cos A \sin B \end{aligned}$$

$$36 \quad \begin{aligned} \cos(A \pm B) &= \cos A \cos B \mp \sin A \sin B \\ \cos(A \pm B) &= \cos A \cos B \mp \sin A \sin B \end{aligned}$$

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

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

$$39 \quad \begin{aligned} a^2 &= b^2 + c^2 - 2bc \cos A \\ a^2 &= b^2 + c^2 - 2bc \cos A \end{aligned}$$

$$40 \quad \begin{aligned} &\text{Luas segi tiga / Area of triangle} \\ &= \frac{1}{2} ab \sin C \end{aligned}$$

$$41 \quad \begin{aligned} &\text{Titik yang membahagi suatu tembereng} \\ &\text{garis} \\ &\text{A point dividing a segment of a line} \\ (x, y) &= \left( \frac{nx_1 + mx_2}{m + n}, \frac{ny_1 + my_2}{m + n} \right) \end{aligned}$$

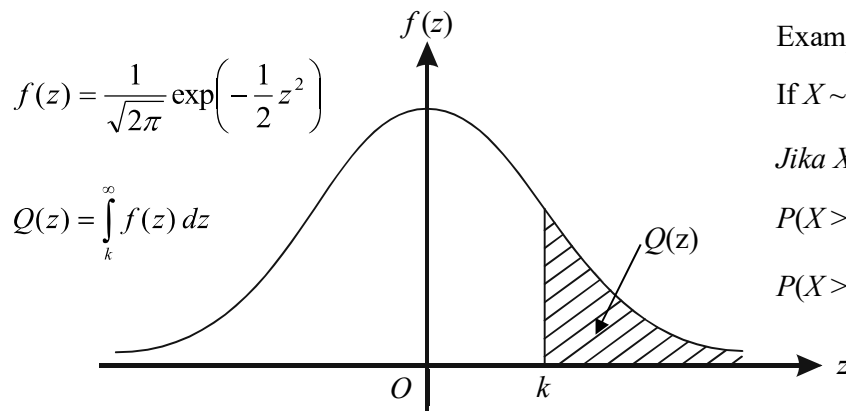
$$42 \quad \begin{aligned} &\text{Luas segi tiga / Area of triangle} \\ &= \frac{1}{2} |(x_1 y_2 + x_2 y_3 + x_3 y_1) - ((x_2 y_1 + x_3 y_2 + x_1 y_3))| \end{aligned}$$

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

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

**KEBARANGKALIAN HUJUNG ATAS  $Q(z)$  BAGI TABURAN NORMAL  $N(0, 1)$**   
**THE UPPER TAIL PROBABILITY  $Q(z)$  FOR THE NORMAL DISTRIBUTION  $N(0, 1)$**

| $z$ | 0       | 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  |



Example/ Contoh:

If  $X \sim N(0, 1)$ , then

Jika  $X \sim N(0, 1)$ , maka

$$P(X > k) = Q(k)$$

$$P(X > 2.1) = Q(2.1) = 0.0179$$

**Bahagian A**

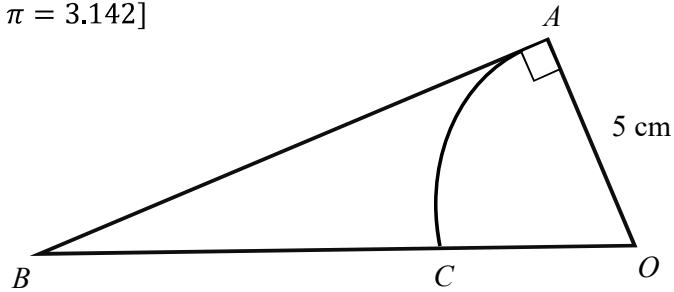
[64 markah]

*Jawab semua soalan.*

- 1 Rajah 1 menunjukkan sektor  $AOC$  berpusat di  $O$  dan  $ABO$  ialah sebuah segitiga bersudut tegak. Diberi  $\angle ABO = \frac{\pi}{5}$  radian, cari panjang lengkok, dalam cm, bagi  $AC$ .

*Diagram 1 shows a sector  $AOC$  with centre at  $O$  and  $ABO$  is a right angle triangle. Given that  $\angle ABO = \frac{\pi}{5}$  radian, find the arc of length, in cm, of  $AC$ .*

[Guna/Use  $\pi = 3.142$ ]



Rajah 1  
Diagram 1

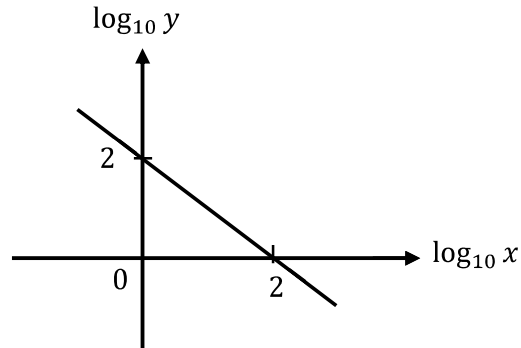
[2 markah]

[2 marks]

Jawapan / Answer :

- 2 Rajah 2 menunjukkan sebahagian daripada garis penyuaiian terbaik apabila graf  $\log_{10} y$  melawan  $\log_{10} x$  diplot.

*Diagram 2 shows a part of the line of best fit when the graph of  $\log_{10} y$  against  $\log_{10} x$  is plotted.*



Rajah 2  
Diagram 2

Nyatakan persamaan garis penyuaiian terbaik. Seterusnya ungkapkan  $y$  dalam sebutan  $x$ .

*State the equation of the line of best fit. Hence express  $y$  in terms of  $x$ .*

[4 markah]

[4 marks]

Jawapan / Answer :

- 3 Sebuah syarikat menawarkan dua skim pembayaran gaji untuk tempoh tiga tahun kepada pekerjanya.

*A company offers two schemes of salary payment for a three-year period to its employees.*

Skim A : 36 kali bayaran bulanan dengan gaji permulaan RM1 200 dan kenaikan bulanan RM5

*Scheme A : 36 monthly payments starting from RM1 200 with monthly increment of RM5*

Skim B : 3 kali bayaran tahunan dengan gaji permulaan RM15 000 dan kenaikan tahunan RM  $y$

*Scheme B : 3 annual payments starting from RM15 000 with yearly increment of RM  $y$*

- (a) Hitung jumlah gaji yang dibayar di bawah skim A untuk tahun pertama

*Calculate the total salary payable under scheme A for the first year*

[2 markah]

[2 marks]

- (b) Cari nilai  $y$ , jika kedua-dua skim itu membayar jumlah gaji yang sama pada hujung tempoh tiga tahun ini.

*Find the value of  $y$ , if both schemes pay the same total salary at the end of the three-year period.*

[3 markah]

[3 marks]

- (c) Jika dia ingin bekerja di Syarikat itu selama 5 tahun, skim yang manakah lebih bermanfaat kepadanya? Jelaskan jawapan anda.

*If he intends to work in the company for 5 years, which scheme is more beneficial to him? Justify your answer.*

[3 markah]

[3 marks]

Jawapan / Answer :

- 4 Diberi persamaan lengkung ialah  $y = (3x - 2)^3$ , cari persamaan normal kepada lengkung pada titik  $S(1, -2)$ .  
Given that the *equation of a curve* is  $y = (3x - 2)^3$ , *find the equation of the normal to the curve at point*  $S(1, -2)$ .

[4 markah]

[4 marks]

Jawapan / Answer:



- 5(a) Diberi bahawa  $f(x) = 2x^2 - 3x - 3$ , cari julat nilai  $x$  dengan keadaan  $f(x) \leq 2$  menggunakan kaedah jadual.  
*It is given that  $f(x) = 2x^2 - 3x - 3$ , find the range of values of  $x$  such that  $f(x) \leq 2$  using table method.*

[2 markah]

[2 marks]

- (b) Persamaan  $f(x) + mx + n = 0$ , dengan keadaan  $m$  dan  $n$  ialah pemalar, mempunyai punca- punca  $\alpha$  dan  $\beta$ .

*The equation  $f(x) + mx + n = 0$ , where  $m$  and  $n$  are constants, has roots  $\alpha$  and  $\beta$ .*

- (i) Nyatakan  $\alpha + \beta$  dan  $\alpha\beta$  dalam sebutan  $m$  dan/atau  $n$ .

*State  $\alpha + \beta$  and  $\alpha\beta$  in terms of  $m$  and/ or  $n$ .*

- (ii) Diberi bahawa punca-punca bagi persamaan kuadratik  $x^2 - kx + 2k = 2$  ialah  $\frac{1}{\alpha}$  dan  $\frac{1}{\beta}$ , dengan keadaan  $k$  ialah pemalar. Ungkapkan  $m$  dalam sebutan  $n$ .

*Given that the roots of the quadratic equation  $x^2 - kx + 2k = 2$  are  $\frac{1}{\alpha}$  and  $\frac{1}{\beta}$ , where  $k$  is a constant. Express  $m$  in terms of  $n$ .*

[5 markah]

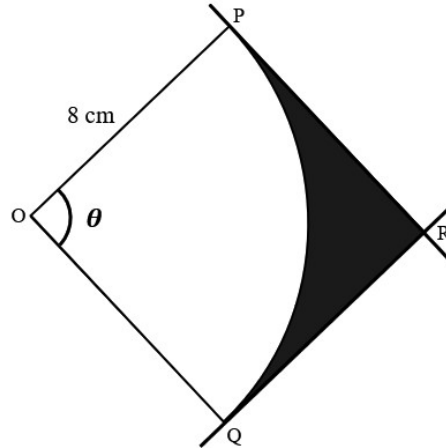
[5 marks]

Jawapan / Answer :

- 6 Dalam Rajah 6,  $P$  dan  $Q$  ialah dua titik pada lengkok satu bulatan berpusat di  $O$ . Tangen pada titik  $P$  dan  $Q$  bersilang di titik  $R$ .

*In the Diagram 6,  $P$  and  $Q$  are two points that lies on a circumference of a circle centre at  $O$ . The tangents at the points  $P$  and  $Q$  intersect at point  $R$ .*

[Guna/ Use  $\pi = 3.142$ ]



Rajah 6  
Diagram 6

Jika panjang lengkok PQ ialah 14.4 cm, cari

*If the arc length PQ is 14.4 cm, find*

(a)  $\theta$  dalam radian,

[2 markah]

$\theta$  in radian,

[2 marks]

(b) luas kawasan berlorek .

[4 markah]

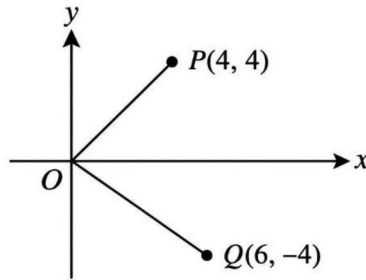
area of the shaded region.

[4 marks]

Jawapan/ Answer :

- 7 (a) Rajah 7 menunjukkan dua vektor,  $\overrightarrow{PO}$  dan  $\overrightarrow{OQ}$ , pada satah Cartes.

*Diagram 7 shows two vectors,  $\overrightarrow{PO}$  and  $\overrightarrow{OQ}$  in a Cartesian plane.*



Rajah 7  
Diagram 7

- (i) Ungkapkan  $\overrightarrow{OP}$  dalam bentuk  $\begin{pmatrix} x \\ y \end{pmatrix}$ .

*Express  $\overrightarrow{OP}$  in the form  $\begin{pmatrix} x \\ y \end{pmatrix}$ .*

- (ii) Ungkapkan  $\overrightarrow{QP}$  dalam bentuk  $x\mathbf{i} + y\mathbf{j}$ .

*Express  $\overrightarrow{QP}$  in the form  $x\mathbf{i} + y\mathbf{j}$ .*

[3 markah]

[3 marks]

- (b) Diberi  $KLMN$  ialah sebuah segi empat selari, dengan keadaan  $\overrightarrow{LM} = \mathbf{i} - 3\mathbf{j}$  dan  $\overrightarrow{MN} = -3\mathbf{i} + 4\mathbf{j}$ . Cari vektor unit dalam arah  $\overrightarrow{KM}$ .

*Given  $KLMN$  is a parallelogram, where  $\overrightarrow{LM} = \mathbf{i} - 3\mathbf{j}$  and  $\overrightarrow{MN} = -3\mathbf{i} + 4\mathbf{j}$ . Find the unit vector in the direction of  $\overrightarrow{KM}$ .*

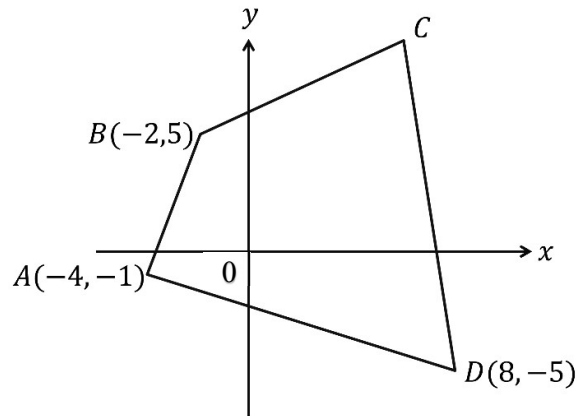
[3 markah]

[3 marks]

Jawapan / Answer :

- 8 Penyelesaian secara lukisan berskala dan/ atau vektor tidak diterima.  
*Solution by scale drawing and/ or vector are not accepted.*

Rajah 8 menunjukkan segi empat  $ABCD$  pada suatu satah Cartes.  
*Diagram 8 shows the quadrilateral  $ABCD$  on a Cartesian plane.*



Rajah 8  
 Diagram 8

- (a) Titik  $P$  berada pada garis  $BD$  dengan keadaan  $3BP = 2PD$ . Tentukan sama ada titik  $P$  adalah pintasan- $y$  atau tidak. [2 markah]  
*Point  $P$  lies on the line  $BD$  such that  $3BP = 2PD$ . Determine whether point  $P$  is the  $y$ -intercept or not. [2 marks]*
- (b) Seterusnya tentukan persamaan garis lurus yang berserenjang dengan garis  $AP$  dan melalui pintasan- $y$  garis  $AP$  tersebut. [4 markah]  
*Hence, determine the equation of the straight line that is perpendicular to line  $AP$  and passes through the  $y$ -intercept of the line  $AP$  itself. [4 marks]*

Jawapan / Answer :

Jawapan / *Answer* :

9 Diberi  $\int_1^2 h(x)dx = 5$ , cari

*Given  $\int_1^2 h(x)dx = 5$ , find*

(a) nilai bagi  $\int_2^1 3h(x)dx$ .

*the value of  $\int_2^1 3h(x)dx$ .*

[1 markah]

[1 mark]

(b) nilai  $k$  jika  $\int_1^2 [h(x) + kx]dx = 11$ .

*the value of  $k$  if  $\int_1^2 [h(x) + kx]dx = 11$ .*

[4 markah]

[4 marks]

- 10** Diberi tiga sebutan pertama bagi suatu jangjang geometri ialah 8, 12, 18, ...  
*Given the first three terms of a geometric progression are 8, 12, 18, ...*

(a) Tentukan hasil tambah  $n$  sebutan pertama.  
*Determine the sum of the first  $n^{\text{th}}$  terms.*

[2 markah]

[2 marks]

(b) Cari hasil tambah dari sebutan keempat hingga sebutan ketujuh.  
*Find the sum of the fourth term to the seventh term.*

[3 markah]

[3 marks]

Jawapan/ *Answer* :

- 11 (a) Diberi  ${}^{n+2}P_3 = 30n$ , tentukan nilai  $n$ .

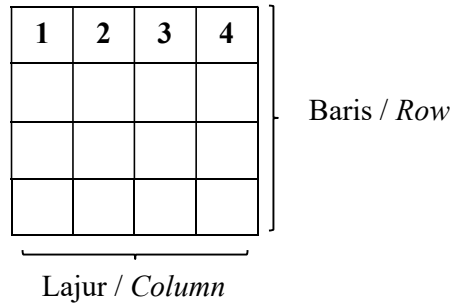
Given  ${}^{n+2}P_3 = 30n$ , find the value of  $n$ .

[4 markah]

[4 marks]

- (b) Rajah 11 menunjukkan satu set grid  $4 \times 4$  bagi permainan Soduku. Setiap baris, lajur dan subgrid hanya boleh diisi dengan digit satu hingga empat tanpa pengulangan.

Diagram 11 shows a set of  $4 \times 4$  grids for a Sudoku game. Each row, column, and sub grid can only be filled with digits one to four without repetition



Rajah 11

Diagram 11

- (i) Berapakah cara yang mungkin untuk anda mengisi digit-digit dalam baris yang pertama dalam permainan Sudoku tersebut?  
How many possible ways are there for you to fill in the digits in the first row of this Sudoku game?

[1 markah]

[1 mark]

- (ii) Encik Parker perlu memilih 3 orang wakil sekolah ke pertandingan Sudoku daripada sekumpulan 4 murid lelaki dan 3 murid perempuan. Berapakah bilangan cara untuk memilih wakil tersebut sekiranya Encik Parker menetapkan sekurang-kurangnya 2 murid perempuan mesti dipilih?

Mr. Parker needs to choose 3 school representatives for a Sudoku competition from a group of 4 male students and 3 female students. How many ways can the representatives be chosen if Mr. Parker stipulates that at least 2 female students must be selected?

[2 markah]

[2 marks]



Jawapan / *Answer* :

- 12 Jadual 12 menunjukkan suatu taburan kebarangkalian pemboleh ubah rawak diskret  $X$ .

*Table 12 shows a probability distribution of the discrete random variable  $X$ .*

|            |     |     |      |      |     |
|------------|-----|-----|------|------|-----|
| $x$        | 0   | 1   | 2    | 3    | 4   |
| $P(X = x)$ | 0.2 | 0.3 | 0.15 | 0.15 | $m$ |

Jadual 12

Table 12

- (a) Cari nilai  $m$ .

*Find the value of  $m$ .*

[1 markah]

[1 mark]

- (b) Seterusnya, cari

*Hence, find*

(i)  $P(X \geq 1)$

(ii)  $P(|X - 3| = 1)$

[3 markah]

[3 marks]

Jawapan/ Answer :

**Bahagian B**

[16 markah]

*Bahagian ini mengandungi tiga soalan. Jawab dua soalan.*

- 13 (a) Bolehkah  $7^{n+3} + 7^{2+n} - 2(7^n)$  dibahagi tepat dengan 21 bagi semua integer positif  $n$ ?  
*Is  $7^{n+3} + 7^{2+n} - 2(7^n)$  divisible by 21 for all positive integers of  $n$ ?*

[4 markah]

[4 marks]

- (b) Ungkapkan  $\frac{5+\sqrt{2}}{\sqrt{32}-2\sqrt{2}}$  dalam bentuk  $a + b\sqrt{c}$ . Seterusnya, nyatakan nilai-nilai  $a$ ,  $b$  dan  $c$ .

*Express  $\frac{5+\sqrt{2}}{\sqrt{32}-2\sqrt{2}}$  in the form  $a + b\sqrt{c}$ . Hence, state the values of  $a$ ,  $b$  and  $c$ .*

[4 markah]

[4 marks]

Jawapan/ Answer :

- 14 (a) Diberi bahawa  $\sin 2\theta = \cos 2\theta$ , dengan keadaan  $\theta$  ialah sudut cakah, cari nilai  $\theta$ .  
*Given that  $\sin 2\theta = \cos 2\theta$ , where  $\theta$  is an obtuse angle, find the value of  $\theta$ .* [2 markah]  
 [2 marks]
- (b) Diberi bahawa  $\sec x = p$ , dengan keadaan  $0 < x < \frac{\pi}{2}$ . Ungkapkan  $\sin 2x$  dalam sebutan  $p$ .  
*Given that  $\sec x = p$ , where  $0 < x < \frac{\pi}{2}$ , express  $\sin 2x$  in terms of  $p$ .* [2 markah]  
 [2 marks]
- (c) Tanpa menggunakan kalkulator, cari nilai  $\sin 15^\circ$  dalam bentuk surd.  
*Without using calculator, find the value of  $\sin 15^\circ$  in surd form.* [4 markah]  
 [4 marks]

Jawapan/ Answer :

- 15 (a) Diberi  $f(x) = x - 4$ , cari  $f^{-1}(x)$   
 Given that  $f(x) = x - 4$ , find  $f^{-1}(x)$

[1 markah]

[1 mark]

- (b) Diberi bahawa  $f(x) = 6x - 1$  dan  $gf(x) = \frac{3}{1-6x}$ ,  $x \neq \frac{1}{6}$ . Cari  $g(x)$ .  
 Seterusnya, tentukan  $g^{2n-1}(x)$ .

It is given that  $f(x) = 6x - 1$  and  $gf(x) = \frac{3}{1-6x}$ ,  $x \neq \frac{1}{6}$ . Find  $g(x)$ .

Hence, determine  $g^{2n-1}(x)$ .

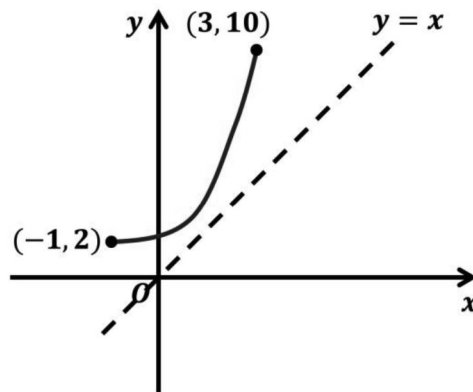
[5 markah]

[5 marks]

- (c) Rajah 15 menunjukkan garis  $y = x$  dan sebahagian graf bagi  $y = f(x)$  untuk domain  $-1 \leq x \leq 3$ . Lakarkan graf  $y = f^{-1}(x)$  pada Rajah 15. Seterusnya nyatakan julat bagi  $f^{-1}(x)$ .

Diagram 15 shows the line of  $y = x$  and part of the graph  $y = f(x)$  for the domain

$-1 \leq x \leq 3$ . Sketch the graph  $y = f^{-1}(x)$  on the Diagram 15. Hence, state the range of  $f^{-1}(x)$ .



Rajah 15  
 Diagram 15

[2 markah]

[2 marks]

Jawapan/ Answer :

Jawapan/ *Answer* :