SAMPEL PERCUMA

Kertas Percubaan STPM Penggal 1 Mathematics T

Set penuh: Kertas Percubaan STPM

Sem 1 · Mathematics T

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- 2 fail PDF
- Semester 1: kertas percubaan (trial) negeri, subjek yang dipilih + skema
- Blueprint 30 hari Semester 1 (setiap subjek)
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Section A [45 marks]

Answer **all** the questions in this section.

1. Show that $f(x) = -2x^3 + 1 \ , x \in R$ is a one – to – one function, sketch the graph, define its domain and range. Mention restrictions if any. [8]

2. Given $f(r) = (r-1)^2(r-2)^2$. Simplify $f(r) - f(r-1)$.
   Hence, deduce the value of $\sum_{r=1}^{n}(r-2)^3$ [5]

3. A system of linear equation is given by

$$x + 2y + z = \beta$$
$$2x + \alpha y + 4z = 3\beta$$
$$x + y + \alpha z = \beta$$

where α and β are constants.

a) write the augmented matrix for the system above and reduce it to row- echelon form. [5]
b) determine the values of α and β such that the system has a unique solution. [3]
c) from (b) deduce the determinant of the matrix.

A= $\begin{bmatrix} 1 & 2 & 1 \\ 2 & \alpha & 4 \\ 1 & 1 & \alpha \end{bmatrix}$ and justify the existence of the inverse [2]

4. The complex number z is given by $z = \frac{3}{4} + \frac{\sqrt{3}}{4}i$.
   a) State z in polar form. [3]
   b) By using de Moivre's theorem, find z^6. [2]
   c) Express $\frac{z^5}{z^*}$ in the form of $x + yi$, where z^* is the conjugate of z, where $x, y \in \Re$. [3]

5. The parametric equation of a conic is defined as

   $x = 3\sec\theta + 5$ and $y = 5tan\,\theta - 8$

   a) Show that the Cartesian equation of the conic represents a hyperbola. Hence, sketch the hyperbola. [5]
   b) State the centre, vertices, foci and asymptotes of the hyperbola. [5]

6. A line l , passes through points S (3,-1,8) and T (5,-4,7) and meets the plane

   $5x - y - 2z = 30$ at point P.

   a) Find the parametric equation of l. [3]
   b) Determine the coordinates of the point P. [3]

Section B [15 marks]
Answer one question only in this section.

7. The polynomial $p(x) = hx^4 + kx^3 + 2x - 1$, where h and k are constants, leaves a reminder of 4 when divided by $x - 1$, and a remainder of -2 when divided by $x + 1$.
   a) Determine the values of h and k. [3]
   b) Express the polynomial $p(x)$ in the form $(x^2 - 1)q(x) + r(x)$, where $q(x)$ is quadratic and $r(x)$ is linear. [4]
   c) Express $q(x)$ in a completed square form $a(x + b)^2 + c$ [2]
   i) Deduce that $q(x)$ is always positive for all real values of x. [1]
   ii) Deduce the minimum value of $q(x)$ and the corresponding value of x. [2]
   d) Determine the set of values of x for which $p(x) > 3x + 1$ [3]

8. By using the elementary row operation, find the inverse matrix of $\begin{pmatrix} 1 & 2 & 4 \\ 2 & 3 & 4 \\ 4 & 3 & 1 \end{pmatrix}$. [10]

School holiday is coming. Three families went to Matta Fair to book a travel trip to China, New York and Australia. The package they have book and amount spent are shown in the following table:

Family	China	New York	Australia	Amount Paid (RM)
Albert	1	2	4	80 000
Jeffrey	2	3	4	110 000
Patrick	4	3	1	100 000

The price of package to Japan, Korea and Taiwan are RM x, RM y, and RM z respectively. Obtain a matrix equation to represent the above information. Hence, determine the price of each package trip. [5]

TAMAT SAMPEL

Suka sampel ini?

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