

Name	Muhammad Syarif Zakwan bin Abdul Khabir	MARKS : (<u>10/14</u>)
ID	242FC243VT	
Lecture Group	TC1L	

1. $(y-6) + d = 2y+3$

$$d = 13+9$$

$$d = 22$$

$$d = 2y - y + 3 + 6$$

$$d = y + 9$$

$$\therefore d = 22$$

$$y = 13$$

$$(2y+3) + d = 4y-1$$

$$d = 4y - 2y - 1 - 3$$

$$d = 2y - 4$$

$$y + 9 = 2y - 4$$

$$13 = y$$

$$y = 13$$

2. $a_5 = ar^{5-1}$
 $= ar^4$

$$a_8 = ar^{8-1}$$

$$= ar^7$$

$$ar^4 = 96$$

$$a = \frac{96}{r^4}$$

$$ar^7 = 768$$

$$a = \frac{768}{r^7}$$

$$\frac{96}{r^4} = \frac{768}{r^7}$$

$$a = \frac{96}{2^4}$$

$$\therefore a = 6$$

$$r = 2$$

$$96r^3 = 768$$

$$r^3 = 8$$

$$r = \sqrt[3]{8}$$

$$r = 2$$

$$a = \frac{96}{16}$$

$$a = 6$$

$$3. \quad 1.2\dot{4}\dot{8} = a$$

$$100 \times a = 100 \times 1.2\dot{4}\dot{8}$$

$$= 124.8\dot{4}\dot{8}$$

$$100a - a = 124.8\dot{4}\dot{8} - 1.2\dot{4}\dot{8}$$

$$99a = 123.6$$

$$a = \frac{123.6}{99}$$

$$a = \frac{206}{165}$$

$$= 1.2\dot{4}\dot{8} = \frac{206}{165}$$

$$4. \quad \binom{n}{r} a^{n-r} b^r$$

$$(x^2)^{12-r} \left(\frac{2}{x}\right)^r = kx^9$$

$$(x^2)^{12-r} (2x^{-1})^r = kx^9$$

$$(x^{24-2r})(2^r x^{-r}) = kx^9$$

$$2^r x^{24-3r} = kx^9$$

$$24 - 3r = 9$$

$$-3r = -15$$

$$r = 5$$

$$\binom{12}{5} (x^2)^{12-5} \left(\frac{2}{x}\right)^5 = 792 (x^{14}) \left(\frac{32}{x^5}\right)$$

$$= 25344 x^{14-5}$$

$$= 25344 x^9$$

5. i)
$$\begin{bmatrix} 3 & 2 & 1 \\ 2 & 5 & 6 \\ 3 & 4 & 5 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 34 \\ 57 \\ 56 \end{bmatrix}$$

ii) $X = A^{-1}B$

$$C = \begin{bmatrix} + \begin{vmatrix} 5 & 6 \\ 4 & 5 \end{vmatrix} & - \begin{vmatrix} 2 & 6 \\ 3 & 5 \end{vmatrix} & + \begin{vmatrix} 2 & 5 \\ 3 & 4 \end{vmatrix} \\ - \begin{vmatrix} 2 & 1 \\ 4 & 5 \end{vmatrix} & + \begin{vmatrix} 3 & 1 \\ 3 & 5 \end{vmatrix} & - \begin{vmatrix} 3 & 2 \\ 3 & 4 \end{vmatrix} \\ + \begin{vmatrix} 2 & 1 \\ 5 & 6 \end{vmatrix} & - \begin{vmatrix} 3 & 1 \\ 2 & 6 \end{vmatrix} & + \begin{vmatrix} 3 & 2 \\ 2 & 5 \end{vmatrix} \end{bmatrix}$$

$$C = \begin{bmatrix} + [5(5) - 6(4)] & - [2(5) - 3(6)] & + [2(4) - 3(5)] \\ - [2(5) - 1(4)] & + [3(5) - 1(3)] & - [3(4) - 2(3)] \\ + [2(6) - 1(5)] & - [3(6) - 2(1)] & + [3(5) - 2(2)] \end{bmatrix}$$

$$C = \begin{bmatrix} +1 & -(-8) & +(-7) \\ -6 & +12 & -6 \\ +7 & -16 & +11 \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 8 & -7 \\ -6 & 12 & -6 \\ 7 & -16 & 11 \end{bmatrix}$$

$$C^T = \begin{bmatrix} 1 & -6 & 7 \\ 8 & 12 & -16 \\ -7 & -6 & 11 \end{bmatrix}$$

$$\begin{aligned}
 |A| &= a_{11}C_{11} + a_{12}C_{12} + a_{13}C_{13} \\
 &= 3(1) + 2(8) + 1(-7) \\
 &= 12
 \end{aligned}$$

$$\begin{aligned}
 A^{-1} &= \frac{1}{|A|} C^T \\
 &= \frac{1}{12} \begin{bmatrix} 1 & -6 & 7 \\ 8 & 12 & -16 \\ -7 & -6 & 11 \end{bmatrix}
 \end{aligned}$$

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \frac{1}{12} \begin{bmatrix} 1 & -6 & 7 \\ 8 & 12 & -16 \\ -7 & -6 & 11 \end{bmatrix} \begin{bmatrix} 34 \\ 57 \\ 56 \end{bmatrix}$$

$$= \frac{1}{12} \begin{bmatrix} 84 \\ 60 \\ 36 \end{bmatrix}$$

$$= \begin{bmatrix} 7 \\ 5 \\ 3 \end{bmatrix}$$

$$\therefore x = 7, y = 5, z = 3$$