

نموذج إجابة مادة الجبر والهندسة الفراغية (باللغة الإنجليزية) لشهادة إتمام الدراسة الثانوية العامة - الدور الأول - العام الدراسي ٢٠١٨/٢٠١٩
النموذج (ج)

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1-

$$(d) \pi$$

١

2-

$$(d) -\frac{1}{2}$$

١

3-

$$\therefore \begin{vmatrix} 1 & x & x \\ x & 1 & x \\ x & x & 1 \end{vmatrix} = 0 \quad C_1 \rightarrow C_1 + C_2 + C_3$$

$$\therefore \begin{vmatrix} 2x+1 & x & x \\ 2x+1 & 1 & x \\ 2x+1 & x & 1 \end{vmatrix} = 0 \quad \begin{array}{c} \triangle \\ 1 \end{array}$$

$$\therefore (2x+1) \begin{vmatrix} 1 & x & x \\ 1 & 1 & x \\ 1 & x & 1 \end{vmatrix} = 0 \quad \begin{array}{l} R_3 \rightarrow R_3 - R_1 \\ R_2 \rightarrow R_2 - R_1 \end{array} \begin{array}{c} \triangle \\ \frac{1}{2} \end{array}$$

$$\therefore (2x+1) \begin{vmatrix} 1 & x & x \\ 0 & 1-x & 0 \\ 0 & 0 & 1-x \end{vmatrix} = 0 \quad \begin{array}{c} \triangle \\ \frac{1}{2} \end{array}$$

$$\therefore (2x+1)(1-x)^2 = 0 \quad \begin{array}{c} \triangle \\ \frac{1}{2} \end{array}$$

$$\therefore 2x = -\frac{1}{2} \quad \vee \quad 2x = 1 \quad \begin{array}{c} \triangle \\ \frac{1}{2} \end{array}$$

3

4-

$$\therefore \frac{4}{1} \neq \frac{1}{-1} \neq \frac{3}{2}$$

\therefore The two straight lines are not parallel 

at the point of intersection:

$$\vec{r}_1 = \vec{r}_2$$

$$\therefore 3 + 4t_1 = t_2 \Rightarrow 4t_1 - t_2 = -3 \quad (1)$$

$$, -1 + t_1 = 4 - t_2 \Rightarrow t_1 + t_2 = 5 \quad (2)$$


$$, 2 + 3t_1 = -1 + 2t_2 \Rightarrow 3t_1 - 2t_2 = -3 \quad (3)$$

$$\text{From (1), (2)} \quad t_1 = \frac{2}{5}, t_2 = \frac{23}{5} \quad \triangle$$

by sub. in eq. (3)

$$\therefore 3 \times \frac{2}{5} - 2 \times \frac{23}{5} = -8 \neq -3$$

\therefore These values do not satisfy eq. (3)

\therefore The two straight lines are skew 

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(تراجعى الحلول الأخرى)

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النموذج (ج)

٣

5-

(c) 1260

1

6-

(a) $56 C_4$

1

7-

(a) $C(1, -2, 0)$, $r = \sqrt{5}$ mit

1

8-

$$(A) z = \frac{8}{1+\sqrt{3}i} \times \frac{1-\sqrt{3}i}{1-\sqrt{3}i} = 2 - 2\sqrt{3}i$$

$$\therefore |z| = \sqrt{4+12} = 4 \quad \left(\frac{1}{2}\right)$$

$$\theta = \tan^{-1}(-\sqrt{3}) = -\frac{\pi}{3} \quad \left(\frac{1}{2}\right)$$

$$\therefore z = 4 \left[\cos\left(-\frac{\pi}{3}\right) + i \sin\left(-\frac{\pi}{3}\right) \right] \quad \left(\frac{1}{2}\right)$$

$$\therefore z^{\frac{1}{2}} = 2 \left[\cos \frac{-\frac{\pi}{3} + 2m\pi}{2} + i \sin \frac{-\frac{\pi}{3} + 2m\pi}{2} \right] \quad \left(\frac{1}{2}\right)$$

$$= 2 \left[\cos \frac{-\pi + 6m\pi}{6} + i \sin \frac{-\pi + 6m\pi}{6} \right], m = 0, 1$$

$$\text{at } m = 0 \quad \therefore z^{\frac{1}{2}} = 2 \left[\cos\left(\frac{-\pi}{6}\right) + i \sin\left(\frac{-\pi}{6}\right) \right] = 2e^{\frac{-\pi i}{6}} \quad \left(\frac{1}{2}\right)$$

$$\text{at } m = 1 \quad \therefore z^{\frac{1}{2}} = 2 \left[\cos \frac{5\pi}{6} + i \sin \frac{5\pi}{6} \right] = 2e^{\frac{5\pi i}{6}} \quad \left(\frac{1}{2}\right)$$

3

$$(B) \therefore (x-1)^6 - 9(x-1)^3 + 8 = 0$$

$$\therefore [(x-1)^3 - 1] [(x-1)^3 - 8] = 0$$

$$\therefore (x-1)^3 = 1$$

$$\therefore x-1 = 1$$

$$\therefore x = 2$$



$$\text{or } (x-1)^3 = 8$$

$$\therefore x-1 = 2$$

$$\therefore x = 3$$



$$\text{or } x-1 = w$$

$$\therefore x = 1+w = -w^2$$



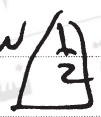
$$\text{or } x-1 = 2w$$

$$\therefore x = 1+2w$$



$$\text{or } x-1 = w^2$$

$$\therefore x = 1+w^2 = -w$$



$$\text{or } x-1 = 2w^2$$

$$\therefore x = 1+2w^2$$



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(تراعى الحلول الأخرى)

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النموذج (ج)

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9-

(b) 0

1

10-

$$\therefore \frac{x}{1} + \frac{y}{2} + \frac{z}{3} = 1$$



$$\therefore 6x + 3y + 2z - 6 = 0 \text{ (general) } \left/ \frac{1}{2} \right.$$

\therefore The plane passes by the point (1,0,0)

$$\therefore (6,3,2) \cdot \vec{r} = (6,3,2) \cdot (1,0,0)$$

$$\therefore (6,3,2) \cdot \vec{r} = 6 \text{ (vector) } \left/ \frac{1}{2} \right.$$

$$6(x-1) + 3y + 2z = 0 \text{ standard } \left/ \frac{1}{2} \right.$$

2

11-

$$A = \begin{pmatrix} 2 & -4 & -9 \\ -1 & 2 & 3 \\ -3 & 6 & 9 \end{pmatrix}$$

$$\therefore |A| = 2(0) + 4(0) + 9(0) = 0 \quad \left(\frac{1}{2}\right)$$

$$\therefore \begin{vmatrix} -4 & -9 \\ 2 & 3 \end{vmatrix} = 6 \neq 0 \quad \left(\frac{1}{2}\right)$$

$$\therefore \text{RK}(A) = 2 \quad \left(\frac{1}{2}\right)$$

$$\therefore A^* = \begin{pmatrix} 2 & -4 & -9 & | & 1 \\ -1 & 2 & 3 & | & 0 \\ -3 & 6 & 9 & | & -1 \end{pmatrix}$$

$$\therefore \begin{vmatrix} -4 & -9 & 1 \\ 2 & 3 & 0 \\ 6 & 9 & -1 \end{vmatrix}$$

$$= -4(-3) + 9(-2) + 1(0)$$

$$= -6 \neq 0 \quad \left(\frac{1}{2}\right)$$

$$\therefore \text{RK}(A^*) = 3$$

$$\therefore \text{RK}(A) \neq \text{RK}(A^*) \quad \left(\frac{1}{2}\right)$$

\therefore The system has no solution $\left(\frac{1}{2}\right)$

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(تراجعى الحلول الأخرى)

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النموذج (ج)

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12-

1 (a)

1

13-

2 (d)

1

14-

6 (c)

1

15-

$$T_{r+1} = {}^{15}C_r \left(\frac{1}{2}\right)^{15-r} (x^2)^r \left(\frac{1}{2}\right)$$
$$= {}^{15}C_r x^{3r-15}$$

put $3r-15=0 \Rightarrow r=5$ $\left(\frac{1}{2}\right)$

$\therefore T_6$ is free of x

$$\therefore T_6 = {}^{15}C_5 \left(\frac{1}{2}\right)$$

T_8, T_9 are the middle terms

$$\therefore \frac{T_9}{T_8} = 1 \Rightarrow \frac{15-8+1}{8} \cdot x^3 = 1 \quad (1)$$

$$\therefore x = 1 \quad \left(\frac{1}{2}\right)$$

3

(تراجعى الحلول الأخرى)

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16-

(a) 1010

1

17-

(a) 13

1

18-

(b) (-4, 0, 4)

1

19-

$$(A) \vec{AB} = \vec{B} - \vec{A} = (1, 0, 0) - (0, 0, 1) \\ = (1, 0, -1)$$

$$\vec{BC} = \vec{C} - \vec{B} = (0, 1, 0) - (1, 0, 0) \\ = (-1, 1, 0)$$

$$\therefore \vec{AB} \times \vec{BC} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 1 & 0 & -1 \\ -1 & 1 & 0 \end{vmatrix}$$

$$= \hat{i} + \hat{j} + \hat{k} \quad \left(\frac{1}{2}\right)$$

$$\therefore \vec{U} = \frac{\vec{AB} \times \vec{BC}}{\|\vec{AB} \times \vec{BC}\|} \\ = \pm \frac{(1, 1, 1)}{\sqrt{3}} \quad \left(\frac{1}{2}\right)$$

$$= \pm \left(\frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}, \frac{1}{\sqrt{3}}\right) \quad \left(\frac{1}{2}\right)$$

2

١٠

$$(B) \left. \begin{array}{l} C_1(-1, 4, k), \quad r_1 = 5 \\ C_2(3, 0, 3), \quad r_2 = 4 \end{array} \right\} \left(\frac{1}{2} \right)$$

$$\therefore C_1 C_2 = \sqrt{16 + 16 + (k-3)^2} = 9 \left(\frac{1}{2} \right)$$

$$\therefore (k-3)^2 = 49$$

$$\therefore k-3 = 7 \quad \text{or} \quad k-3 = -7$$

$$\therefore k = 10 \left(\frac{1}{2} \right) \quad \text{or} \quad k = -4 \left(\frac{1}{2} \right)$$

2

(تراجعى الحلول الأخرى)

(انتهت الإجابة وتراجعى الحلول الأخرى)