

## الفصل الدراسي الثاني : مراجعة الوحدة السادسة : المصفوفات ( Matrices )

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**Q(1)** : Determine the **row operation** performed to obtain each matrix.

حدد عملية الصف التي تم القيام بها للحصول على كل مصفوفة .

$$1) \left[ \begin{array}{ccc|c} 1 & 5 & -6 & 3 \\ 0 & 1 & -3 & -2 \\ 0 & -1 & 2 & 1 \end{array} \right] \longrightarrow \left[ \begin{array}{ccc|c} 1 & 5 & -6 & 3 \\ 0 & 1 & -3 & -2 \\ 0 & 0 & -1 & -1 \end{array} \right]$$

a)  $R_1 + R_2$

b)  $R_2 + R_3$

c)  $R_2 - R_3$

d)  $-R_1 + R_2$

**Q(2)**: Write the **augmented** matrix for the given system of equations.

• اكتب المصفوفة الموسعة لنظام المعادلات المعطى .

A) 
$$\begin{aligned} x + 2y - z &= 3 \\ 2x - y + 2z &= 6 \\ x - 3y + 3z &= 4 \end{aligned}$$

a)  $\left[ \begin{array}{ccc|c} 1 & 2 & -1 & 3 \\ 2 & -1 & 2 & 6 \\ 1 & -3 & 3 & 4 \end{array} \right]$  b)  $\left[ \begin{array}{ccc|c} -1 & -2 & 1 & 6 \\ -2 & 1 & 2 & 3 \\ 4 & -3 & 3 & 4 \end{array} \right]$  c)  $\left[ \begin{array}{ccc|c} 1 & -2 & 1 & 6 \\ 2 & 1 & 2 & 3 \\ 4 & -3 & 3 & 4 \end{array} \right]$

B) 
$$\begin{aligned} 4x - 3y &= 11 \\ 3x + 2y &= 4 \end{aligned}$$

a)  $\left[ \begin{array}{cc|c} 4 & -3 & 11 \\ 4 & 3 & 3 \end{array} \right]$  b)  $\left[ \begin{array}{cc|c} 4 & -3 & 11 \\ 3 & 2 & 4 \end{array} \right]$  c)  $\left[ \begin{array}{cc|c} -4 & 3 & 11 \\ -3 & 2 & 4 \end{array} \right]$

**Q(3)** : Find the system of equations from the **augmented** matrix .

$$\left[ \begin{array}{ccc|c} 1 & -3 & -5 & -2 \\ 2 & -5 & -4 & 5 \\ -3 & 5 & 4 & 6 \end{array} \right]$$

a) 
$$\begin{aligned} x + 3y + 5z &= \\ 2x - 5y - 4z &= \\ 3x + 5y + 4z &= \end{aligned}$$

b) 
$$\begin{aligned} x - 3y - 5z &= -2 \\ 2x - 5y - 4z &= 5 \\ -3x + 5y + 4z &= 6 \end{aligned}$$

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**Q(4):** Solve the system of each equations.

$$3x + 4y = 10$$

A)

$$x + 3y = 5$$

- a) ( 1 , 2 )      b) ( 2 , 1 )      b) No solution      c) infinite solutions

$$3x + 4y = 12$$

B)

$$6x + 8y = 24$$

- a) ( 2 , 1 )      b) ( 1 , 2 )      c) No solution      d) infinite solutions

$$8x - 8y - 8z = 24$$

C)

$$-2x + 4y - 4z = -12$$

$$x - 3y + 4z = 4$$

- a) ( 20 , 12 , 5 )      b) ( 10 , 6 , 5 )      c) ( 5 , 10 , 4 )      d) ( 2 , 5 , 10 )

**Q(5):** Which matrices in **not** row-echelon form ?

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a) 
$$\begin{bmatrix} 1 & -2 & 5 & 6 & -7 \\ 0 & 1 & -3 & 0 & 2 \\ 0 & 0 & 1 & 3 & -5 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

b) 
$$\begin{bmatrix} 1 & -2 & 3 & 6 & -4 \\ 0 & 1 & -2 & -6 & 2 \\ 0 & 0 & 1 & 7 & -5 \\ 0 & 0 & 0 & 1 & 9 \end{bmatrix}$$

c) 
$$\begin{bmatrix} 1 & -2 & 5 & 2 & -1 \\ 0 & 4 & -2 & 0 & 2 \\ 0 & 0 & 1 & 3 & -3 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$$

d) 
$$\begin{bmatrix} 1 & -1 & 1 & 3 & 8 \\ 0 & 1 & 0 & -2 & 8 \\ 0 & 0 & 1 & 2 & 7 \\ 0 & 0 & 0 & 1 & 10 \end{bmatrix}$$

**Q(6):** Evaluate the **determinant** of matrix A and B :

$$A = \begin{bmatrix} 3 & -4 \\ 2 & -2 \end{bmatrix}$$

- a) -2      b) 2      c) 3      d) -3

$$B = \begin{bmatrix} 4 & -1 & 2 \\ 2 & 5 & -2 \\ 0 & -3 & 7 \end{bmatrix}$$

- a) 25      b) 118      c) 81      d) 39

**Q(7):** Given that  $A = \begin{bmatrix} -10 & 2 \\ 5 & -8 \end{bmatrix}$  and  $B = \begin{bmatrix} 3 & -1 \\ -4 & -2 \end{bmatrix}$ , determine  $AB$ .

a)  $\begin{bmatrix} -38 & 6 \\ 42 & 21 \end{bmatrix}$     b)  $\begin{bmatrix} -38 & 6 \\ 47 & 11 \end{bmatrix}$     c)  $\begin{bmatrix} 38 & 6 \\ -47 & 11 \end{bmatrix}$     d)  $\begin{bmatrix} 38 & -6 \\ 47 & 11 \end{bmatrix}$

**Q(8):** Find the **inverse** of matrix A:  $A = \begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$

a)  $A^{-1} = \begin{bmatrix} 2 & 1 \\ 5 & 3 \end{bmatrix}$     b)  $A^{-1} = \begin{bmatrix} 3 & -1 \\ -5 & 2 \end{bmatrix}$     c)  $A^{-1} = \begin{bmatrix} -2 & 5 \\ 1 & -3 \end{bmatrix}$

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**Q(9):** Which one of the following matrices is singular ?

A $P = \begin{bmatrix} -6 & 9 \\ 2 & 3 \end{bmatrix}$	B $Q = \begin{bmatrix} -6 & 9 \\ -2 & -3 \end{bmatrix}$
C $R = \begin{bmatrix} 6 & 9 \\ 2 & -3 \end{bmatrix}$	D $S = \begin{bmatrix} -6 & 9 \\ 2 & -3 \end{bmatrix}$

**Q(10).** A company sells a box that contains a mixture of pencils and pens. A pencil costs the company AED 0.25 and a pen costs AED 0.50. There are a total of 50 pencils and pens in the company of the pencils and pens in a box is AED 20. How many pencils and how many pens are in a box ?

شركة تباع علبة بها خليط من أقلام الرصاص وأقلام الحبر. إذا كان قلم الرصاص يكلف الشركة 0.25 درهم قلم الحبر يكلف الشركة 0.50 درهم. يوجد إجمالي 50 قلماً من الحبر والرصاص في الصندوق، وثمان الصندوق من أقلام الرصاص والحبر في العلبة 20 يكلف درهماً إماراتياً. كم عدد أقلام الرصاص وكم عدد أقلام الحبر في الصندوق؟

- a) There are 20 pencils and 20 pens .    b) There are 20 pencils and 30 pens  
c) There are 30 pencils and 20 pens    d) There are 10 pencils and 40 pens

**Q(11)** :A triangle ABC with vertices **A(-1 , -2) , B(0, -4) , C(2, -3)** , Find the **image** after reflected over the  $x - axis$  .

- a)  $(-2, -1), (-4, 0), (-3, 2)$       b)  $(-1, 2), (0, 4), (2, 3)$       c)  $(1, -2), (0, -4), (-2, -3)$

**Q(12)** :A triangle ABC with vertices **A(1 , 2) , B(-1, 4) , C(2, 3)** , Find the **image** after reflected over the  $y - axis$  .

- a)  $(-1, -2), (1, -4), (-2, -3)$       b)  $(1, -2), (-1, -4), (2, -3)$       c)  $(-1, 2), (1, 4), (-2, 3)$

**Q(13)** :A triangle ABC with vertices **A(-1 , -2) , B(0, -4) , C(2, -3)** translated **2 units right and 3 units down** , write the matrix represent the image after translation.

A) $\begin{bmatrix} 1 & 2 & 4 \\ -5 & -7 & -6 \end{bmatrix}$	A) $\begin{bmatrix} -3 & -2 & 0 \\ -5 & -7 & -6 \end{bmatrix}$
c) $\begin{bmatrix} -5 & -7 & -6 \\ 1 & 2 & 4 \end{bmatrix}$	A) $\begin{bmatrix} -3 & -2 & 0 \\ 1 & -1 & 0 \end{bmatrix}$

**Q(14)** : Find the coordinates of the dilated kite ABCD with a scalar factor equal to 1.5 such that A(1,2), B(2,3) , C(3,2) and D(2,0).

a)  $\begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 2 & 0 \end{bmatrix}$

b)  $\begin{bmatrix} 1.5 & 3 & 4.5 & 3 \\ 3 & 4.5 & 3 & 0 \end{bmatrix}$

c)  $\begin{bmatrix} 2 & 3 & 4 & 3 \\ 3 & 4 & 3 & 1 \end{bmatrix}$

d)  $\begin{bmatrix} 2.5 & 3 & 4 & 3 \\ 3.5 & 5 & 3 & 0 \end{bmatrix}$

**Q(15)** : Find the location of the points A(-1 , 2) , B( 0 , 3) and C(1 , 2) at  $90^\circ$  counterclockwise rotation about the origin .

a)  $\begin{bmatrix} -1 & 0 & 1 \\ 2 & 3 & 2 \end{bmatrix}$

b)  $\begin{bmatrix} -1 & 0 & 1 \\ -2 & -3 & -2 \end{bmatrix}$

c)  $\begin{bmatrix} -2 & -3 & -2 \\ -1 & 0 & 1 \end{bmatrix}$

d)  $\begin{bmatrix} -1 & 0 & -1 \\ 2 & 3 & -2 \end{bmatrix}$

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**Q(16)** : Find the location of the points A(1 , -2) , B( 1 ,1) and C(-1 , 2) at  $180^{\circ}$  counterclockwise rotation about the origin .

a)  $\begin{bmatrix} 1 & -1 & 1 \\ -2 & -1 & -2 \end{bmatrix}$

b)  $\begin{bmatrix} -1 & -1 & 1 \\ 2 & -1 & -2 \end{bmatrix}$

c)  $\begin{bmatrix} 2 & 1 & 2 \\ -1 & 1 & -1 \end{bmatrix}$

d)  $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 2 \end{bmatrix}$

**Q(16)** : Find the location of the points A(1 , -2) , B( 1 ,1) and C(-1 , 2) at  $270^{\circ}$  counterclockwise rotation about the origin .

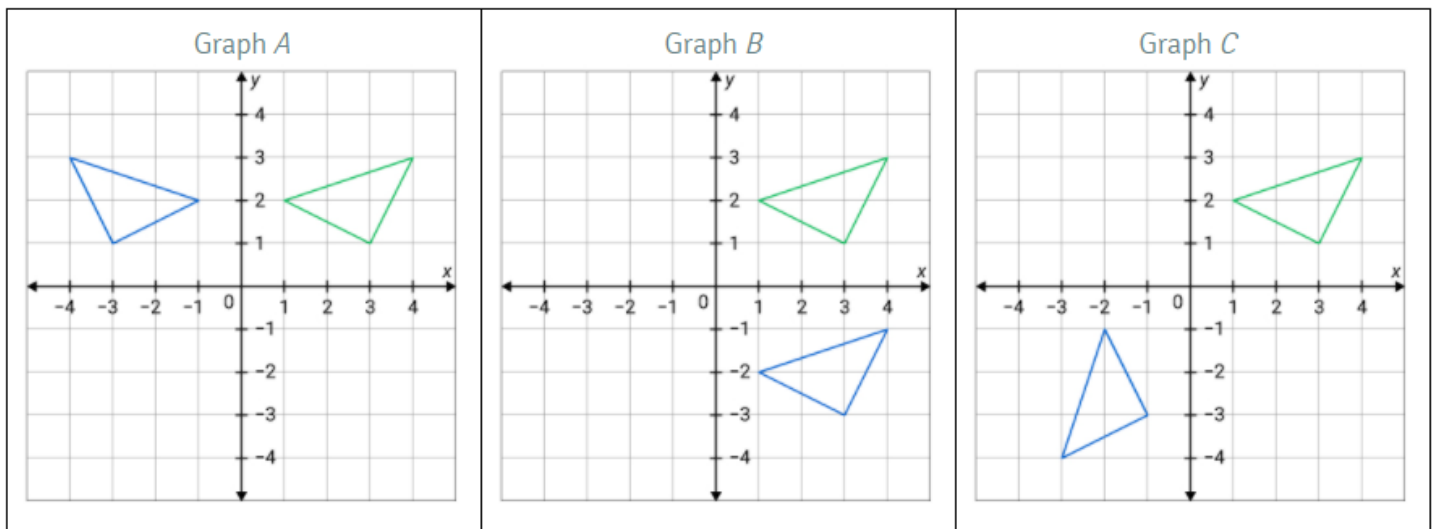
a)  $\begin{bmatrix} 1 & -1 & 1 \\ -2 & -1 & -2 \end{bmatrix}$

b)  $\begin{bmatrix} -1 & -1 & 1 \\ 2 & -1 & -2 \end{bmatrix}$

c)  $\begin{bmatrix} -2 & 1 & 2 \\ -1 & -1 & 1 \end{bmatrix}$

d)  $\begin{bmatrix} 1 & 1 & 1 \\ 2 & 1 & 2 \end{bmatrix}$

**Q(17)**: Which graph represent reflection over  $y - axis$ ?



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