FINAL REVISION

ALGEBRA

FORM 10

SECOND TERM

Mr. Samer

Final Revision Algebra Form "10"

1. Choose the correct answer:

1) $A = \begin{pmatrix} 3 & 1 \\ 5 & 2 \end{pmatrix}$, $A^{-1} = \begin{pmatrix} 2 & -1 \\ x & 3 \end{pmatrix}$, $x =$ .....

a) 3 b) -3 c) 5 d) -5

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2) ..... $\in$ S.S of: $x > 2$, $y > 1$ and $x + y \geq 3$

a) (2 , 1) b) (1 , 2) c) (3 , 2) d) (1 , 3)

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3) S.S of $\begin{vmatrix} x+2 & 2 \\ x & x-3 \end{vmatrix} = 4$ is .....

a) {3 , -2} b) {5 , -2} c) φ d) {3 , -3}

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4) If $\begin{pmatrix} 0 & 2 & 5 \\ x & 0 & 3 \\ 5 & 3 & 0 \end{pmatrix}$ is symmetric matrix , then $x =$ .....

a) 2 b) -2 c) 0 d) 3

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5) $A = \begin{pmatrix} 3 & 1 \\ -2 & 5 \end{pmatrix}$, $C = \begin{pmatrix} 4 & 7 \\ 8 & 9 \end{pmatrix}$, then $a_{21} + c_{12} =$ .....

a) 3 b) 7 c) 5 d) 4

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6) If $A = \begin{pmatrix} x & 2 \\ 2 & x \end{pmatrix}$ has a multiplicative inverse , then $x \in$ .....

a) {-2 , 2} b) R - {-2 , 2} c) R d) {2}

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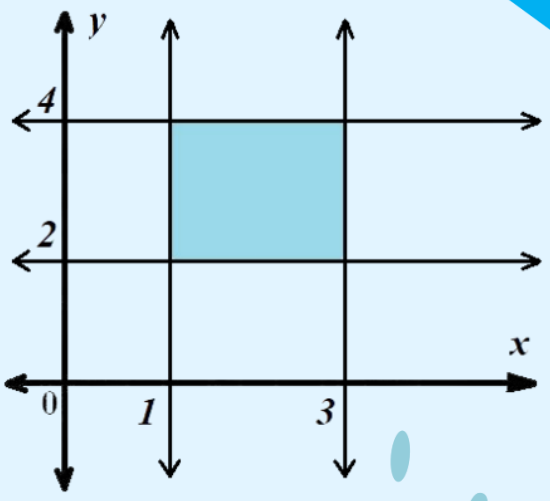
7) The opposite figure represents:

a) $x > 1 , y > 2$

b) $1 < x < 3 , 2 < y < 4$

c) $1 \leq x \leq 3 , 2 \leq y \leq 4$

d) $x < 3 , y > 2$



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8) $\begin{pmatrix} 3 & a-2 \\ b & 5 \end{pmatrix} = \begin{pmatrix} 3 & 4 \\ 7 & 5 \end{pmatrix}^t$, then $(a \quad b) =$ .....

a) $(6 \quad 7)$ b) $(4 \quad 9)$ c) $(7 \quad 6)$ d) $(9 \quad 4)$

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9) If $AB = \begin{pmatrix} 3 & -1 \\ 4 & 5 \end{pmatrix}$, then $B^t A^t =$ .....

a) $\begin{pmatrix} 3 & -1 \\ 4 & 5 \end{pmatrix}$ b) $\begin{pmatrix} 3 & 4 \\ -1 & 5 \end{pmatrix}$ c) $\begin{pmatrix} 5 & 4 \\ -1 & 3 \end{pmatrix}$ d) $\begin{pmatrix} 5 & -1 \\ 4 & 3 \end{pmatrix}$

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10) If ℓ , m are roots of: $x^2 - 4x - 10 = 0$, then: $\begin{vmatrix} 2\ell & -1 \\ 3 & m \end{vmatrix}$ = ...

a) -17 b) 17 c) -3 d) 18

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11) A is a square matrix, then $A + A^t$ is ..... matrix.

a) symmetric b) diagonal c) zero d) skew

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12) S.S of $\begin{vmatrix} x^2 & 5 \\ 3 & x \end{vmatrix} = 12$ in R is .....

a) φ b) {3} c) {3 , -3} d) 27

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13) $A_{1 \times 3}$, $B^t_{1 \times 3}$, then it's possible to find .....

a) $A + B$ b) $B^t + A^t$ c) AB^t d) AB

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14) $A = \begin{pmatrix} \cos\theta & \sin\theta \\ \sin\theta & -\cos\theta \end{pmatrix}$, $A^{2019} =$ .....

a) A ● b) A^2 c) $2019\,A^3$ d) $2019\,I$

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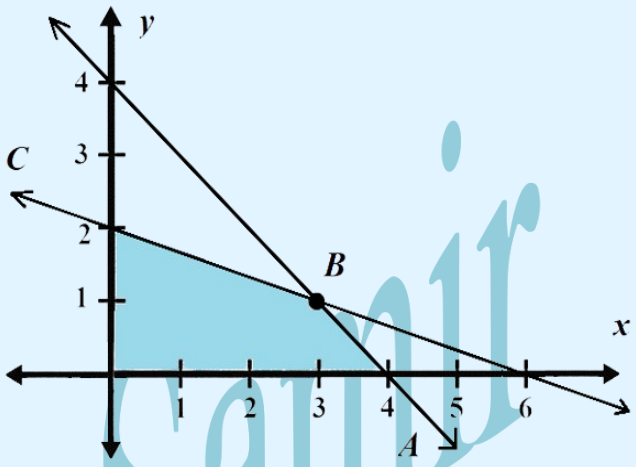
15) Shaded part is S.S of: $x \geq 0$, $y \geq 0$

$x + 3y \leq 6$ and $x + y \leq 4$, then

maximum value of $P = 2x + y$ is ...

a) 7 b) 8 ●

c) 3 d) 4



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16) Sum of roots of the equation: $\begin{vmatrix} x & 1 & 4 \\ 0 & x+1 & 2 \\ 0 & 0 & x-2 \end{vmatrix} = 0$ is .....

a) -2 b) 1 c) 0 d) -1

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17) If $\begin{vmatrix} x & -1 \\ 2 & x \end{vmatrix} + \begin{vmatrix} 1 & 3 \\ 2 & x \end{vmatrix} = 2$, then $x =$ .....

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

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18) $A\,(\Delta ABC) =$ ..... cm^2 , where: $A(1\,,\,6)$, $B(0\,,\,10)$, $C(0\,,\,0)$

a) 5 ● b) 15 c) 10 d) 20

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19) If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 6$ and $\begin{vmatrix} ak & kc \\ c & d \end{vmatrix} = -24$, then $k =$ .....

a) 4 b) 3 c) -3 d) -4

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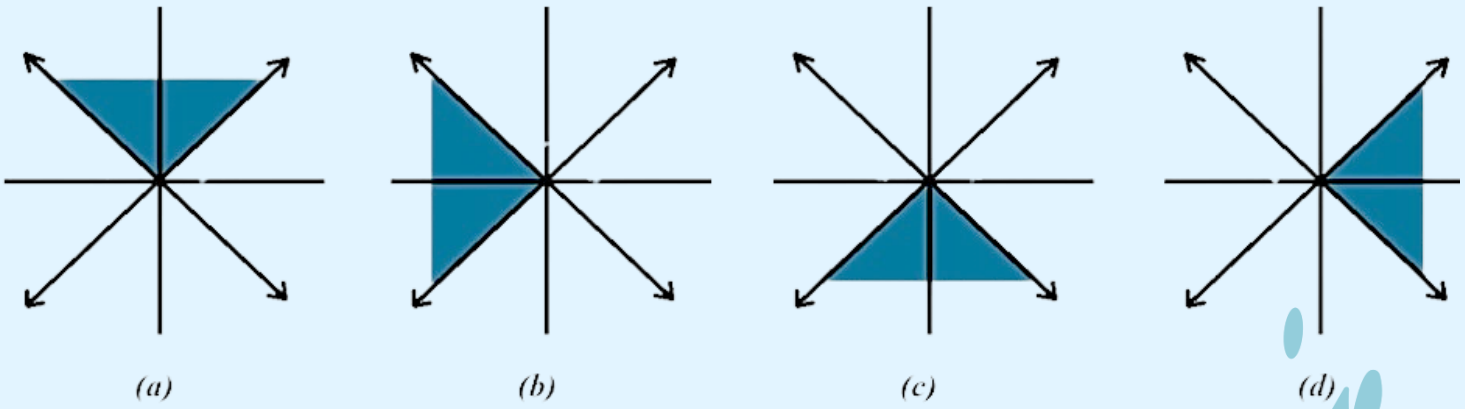
20) The solution set of the inequality: $-x \leq y \leq x$ is .....



(a) (b) (c) (d)

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21) <u>The opposite figure:</u>

represents the S.S of the inequality

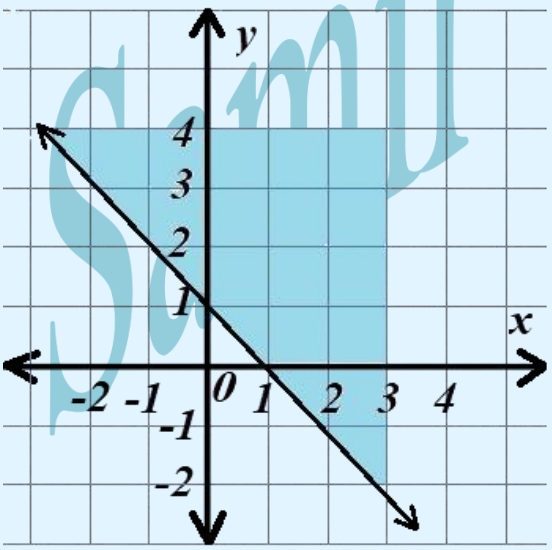
..... in $R \times R$

a) $x + y \geq 1$

b) $x + y \leq 1$

c) $x + y > 1$

d) $x - y < 1$



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22) $A = \begin{pmatrix} 4 & 0 \\ 3 & -4 \end{pmatrix}$, A^{60} = ...

a) $2^{60}\ I$ b) $4^{120}\ I$ c) I d) $2^{120}\ I$

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23) If $\begin{vmatrix} \ell & 2 & -1 \\ x-2 & n & 3 \\ 0 & 0 & m \end{vmatrix} = \ell\ m\ n$, then x = ...

a) 2 b) 6 c) -2 d) $m\ n$

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24) ..... $\notin$ S.S of: $x + y > 7$, $x > 0$, $y < 2$ is .....

a) (6 , 1) b) (10 , 0) c) (3 , 6) d) (-1 , 10)

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25) $\begin{pmatrix} x+3 & 2 \\ 2 & x-3 \end{pmatrix}$ has no multiplicative inverse , then x = ...

a) ± 3 b) ± $\sqrt{13}$ c) ± 5 d) 5

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26) If ℓ , m are roots of the equation: $x^2 - 4x - 10 = 0$, then:

$\begin{vmatrix} 2\ell & -1 \\ 3 & m \end{vmatrix}$ = ...

a) 17 b) 20 c) -17 d) -20

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27) The value of $\begin{vmatrix} 3 & 0 & 0 \\ 2 & 5 & 0 \\ 1 & 4 & 2 \end{vmatrix}$ = ...

a) 8 b) 6 c) 15 d) 30

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28) If the matrix $\begin{bmatrix} x & 4 \\ 9 & x \end{bmatrix}$ has no multiplicative inverse, then: x = ...

a) 6 b) -6 c) ± 6 d) 13

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29) If A is a symmetric matrix , then $A - A^T$ = ...

a) O b) A c) A^T d) 2A

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30) If A is a matrix of order 2 × 3 and B is a matrix of order 3 × 3 , then the order of matrix AB = ...

a) 2 × 2 b) 2 × 3 c) 3 × 2 d) 3 × 3

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31) The point which belongs to the solution set of the inequalities x > 2 , y > 1 and x + y ≥ 3 is .....

a) (2 , 1) b) (2 , 2) c) (3 , 2) d) (3 , 1)

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32) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 0 & 2 \end{pmatrix} = \begin{pmatrix} \cdots & \cdots \\ \cdots & \cdots \end{pmatrix}$

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33) $\begin{vmatrix} 2 & 3 \\ 4 & 1 \end{vmatrix} \times \begin{vmatrix} 0 & -1 \\ 2 & 1 \end{vmatrix} =$ .....

34) The S.S of the equation $\begin{vmatrix} x^2 & 5 \\ 3 & x \end{vmatrix} = 12$, in R is .....

a) {6} b) {3} c) {-3} d) {±3}

35) If A is a matrix of order 2 × 3 ad B^t is a matrix of order 1 × 3 , then AB is a matrix of order .....

a) 3 × 1 b) 2 × 1 c) 3 × 2 d) 1 × 3

36) If $A \times \begin{pmatrix} 3 & -1 \\ 2 & -1 \end{pmatrix} = I$, then A = ...

a) $\begin{pmatrix} 1 & -1 \\ 2 & -3 \end{pmatrix}$ b) $\begin{pmatrix} 2 & -1 \\ 3 & -1 \end{pmatrix}$ c) $\begin{pmatrix} -1 & 3 \\ -1 & 2 \end{pmatrix}$ d) $\begin{pmatrix} -1 & 1 \\ -2 & 3 \end{pmatrix}$

37) The value of the determinant $\begin{vmatrix} 4 & 5 & 2 \\ 0 & 1 & -1 \\ 0 & 0 & 2 \end{vmatrix} =$ .....

a) 8 b) -2 c) -8 d) 4

38) If the matrix $\begin{pmatrix} 3 & -1 \\ 6 & x \end{pmatrix}$ has no multiplicative inverse, then x = ...

a) -2 b) 2 c) 0 d) -1

39) $\begin{pmatrix} 2 & 0 \\ 1 & 0 \end{pmatrix} \begin{pmatrix} 0 & 1 \\ 0 & 2 \end{pmatrix} =$ .....

a) $\begin{pmatrix} 0 & 0 \\ 1 & 2 \end{pmatrix}$ b) $\begin{pmatrix} 2 & 0 \\ 1 & 0 \end{pmatrix}$ c) $\begin{pmatrix} 0 & 2 \\ 0 & 1 \end{pmatrix}$ d) $\begin{pmatrix} 1 & 2 \\ 0 & 0 \end{pmatrix}$

40) The point which belongs to the solution set of the inequalities:

$x \geq 0$, $y \geq 0$, $2x + y < 4$, $x + 3y < 6$ is .....

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

2. Essay Questions:

1) Find the minimum value of the objective function $P = 2x + 3y$ under conditions: $x + y \leq 5$, $y \geq 1$, $x \geq 2$

(Ans: pt(2 , 1) , $P_{min} = 7$)

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2) $A = \begin{pmatrix} -1 & 4 \\ -2 & 3 \end{pmatrix}$, $A = A^{-1} \times B$, Find B (Ans: $\begin{pmatrix} -7 & 8 \\ -4 & 1 \end{pmatrix}$)

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3) $A \times \begin{pmatrix} 1 & 2 \\ -1 & 1 \end{pmatrix} = I$, Find 3A (Ans: $\begin{pmatrix} 1 & -2 \\ 1 & 1 \end{pmatrix}$)

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4) $A^{-1} = \begin{pmatrix} -1 & 2 \\ 1 & 3 \end{pmatrix}$, $AB = \begin{pmatrix} 4 & -2 \\ 0 & 1 \end{pmatrix}$, Find B (Ans: B = $\begin{pmatrix} -4 & 4 \\ 4 & 1 \end{pmatrix}$)

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5) $X + \begin{pmatrix} 2 & -3 \\ 1 & 0 \end{pmatrix}^t = 0 \rightarrow$ $X =$ .....

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6) Solve $x + 2y = 3$ and $3x - y + 9 = 0$ using: 1st Cramer's law , 2nd: Matrices (Ans: S.S = {3 , 0})

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7) By using graph find in $R \times R$ the solution set of the following inequalities: $x \geq 0$, $y \geq 0$, $2x + y \leq 8$ and $x + y \leq 5$