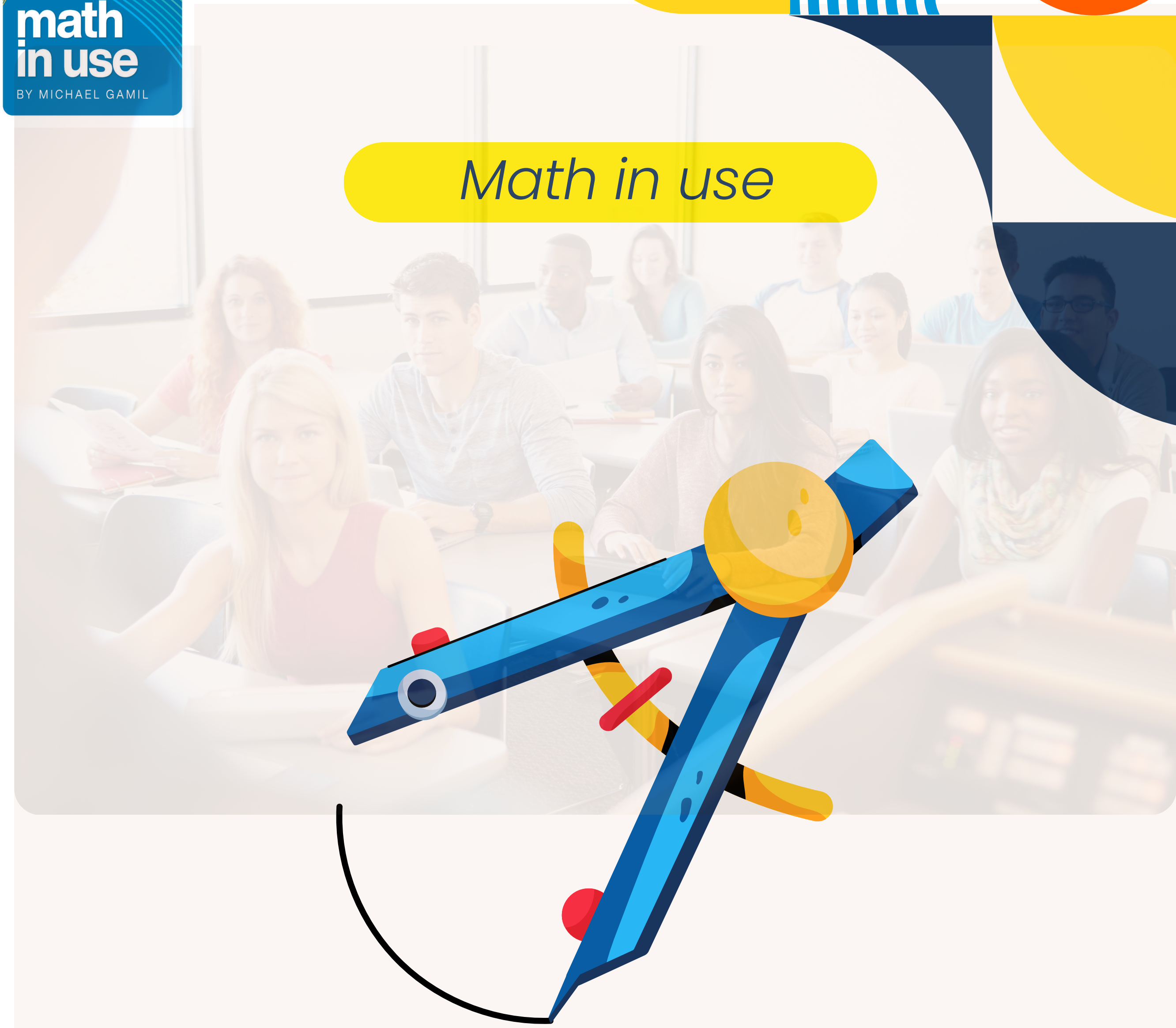
Math in use



Algebra Final revision

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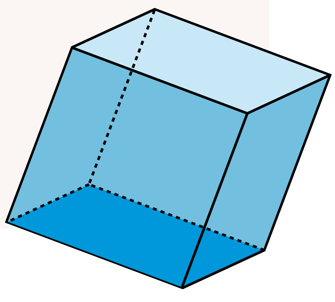


Final Revision
Algebra

Choose the correct answer

If the matrix A of order 3×4 , then the row contains .... elements.

(a) 3 (b) 4 (c) 7 (d) 12

If A is a matrix of order 3×1 , B is a matrix of order 1×3 , then : AB is a matrix of order ....

(a) 3×1 (b) 1×1 (c) 3×3 (d) 1×3

If $A = \begin{pmatrix} 0 & 2 \\ 3 & -4 \end{pmatrix}$, $mA = \begin{pmatrix} 0 & 3c \\ 2b & 24 \end{pmatrix}$, then $c + b - m =$ ....

(a) -19 (b) -7 (c) 7 (d) 16

If $x\begin{pmatrix} 1 \\ 3 \end{pmatrix} + y\begin{pmatrix} 2 \\ 0 \end{pmatrix} = \begin{pmatrix} 5 \\ 3 \end{pmatrix}$, then $x + y =$ ....

(a) 2 (b) 3 (c) 4 (d) 6

If $A = \begin{pmatrix} 3 & -2 & 7 \\ 5 & -4 & 2 \end{pmatrix}$, and $B = A^t$, then $a_{13} + b_{31} =$ ....

(a) 4 (b) 9 (c) 14 (d) 10

If X is a matrix , then $(X^t)^t + X =$ ....

(a) X (b) 2 X (c) $\square$ (d) zero

If the matrix A of order 2×2 where $A = (a_{ij})$, where $a_{ij} = 2i + j$, then A = ...

(a) $\begin{pmatrix} 3 & 5 \\ 4 & 6 \end{pmatrix}$ (b) $\begin{pmatrix} 3 & 4 \\ 5 & 6 \end{pmatrix}$ (c) $\begin{pmatrix} 3 & 5 \\ 6 & 4 \end{pmatrix}$ (d) $\begin{pmatrix} 3 & 6 \\ 5 & 4 \end{pmatrix}$

If $A = \begin{pmatrix} x & y \\ z & \ell \end{pmatrix}$ is skew symmetric matrix , then $\frac{y}{z} + x - \ell =$ ....

(a) 1 (b) 0 (c) – 1 (d) – 2

If $A = \begin{pmatrix} 1 & 1 & x-1 \\ 1 & 3 & 5 \\ -1 & 5 & 6 \end{pmatrix}$ is a symmetric matrix , then $x =$ ....

(a) – 1 (b) zero (c) 4 (d) 6

If $A + A^t = O$, then A is a .... matrix.

(a) row (b) column (c) symmetric (d) skew

If $\begin{pmatrix} a & b \\ c & d \end{pmatrix} = 3\,I$ where I is the unit matrix , then a + b + c + d = ...

(a) 5 (b) 6 (c) 7 (d) 8

If $\begin{pmatrix} 3^x & 2x + y \\ x + y & 3^y \end{pmatrix} = \begin{pmatrix} 25 & b \\ a & 5 \end{pmatrix}$, then $\frac{b}{a} =$ ....

(a) $\frac{3}{5}$ (b) $\frac{5}{3}$ (c) 15 (d) 5

If A , B are two matrices where $AB = \begin{pmatrix} 3 & -1 \\ 4 & 5 \end{pmatrix}$, then $B^t A^t =$ ....

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

If $A = \begin{pmatrix} 2 & -1 \\ 3 & 1 \end{pmatrix}$, then $A^2 =$ ....

(a) $\begin{pmatrix} 4 & 1 \\ 9 & 1 \end{pmatrix}$ (b) $\begin{pmatrix} 4 & 9 \\ 1 & 1 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & -3 \\ 9 & 2 \end{pmatrix}$ (d) $\begin{pmatrix} 1 & -3 \\ 9 & -2 \end{pmatrix}$

If $\begin{pmatrix} 3 & 2 & x \\ 4 & 5 & 1 \end{pmatrix} \begin{pmatrix} 2 & -1 \\ 1 & 0 \\ y & 2 \end{pmatrix} = \begin{pmatrix} 14 & -1 \\ 19 & -2 \end{pmatrix}$, then $x - y =$ ....

(a) 3 (b) – 3 (c) 5 (d) – 5

If $A = \begin{pmatrix} 2 & x \\ -x & 2 \end{pmatrix}$, $A^2 = \begin{pmatrix} -5 & 12 \\ -12 & -5 \end{pmatrix}$, then $x =$ ....

(a) 3 (b) – 3 (c) 4 (d) zero.

$\begin{pmatrix} \sin\theta & \cos\theta \\ -\cos\theta & \sin\theta \end{pmatrix}\begin{pmatrix} \sin\theta & \cos\theta \\ \cos\theta & -\sin\theta \end{pmatrix} = \dots\dots\dots\dots$

(a) I (b) – I (c) $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ (d) $\begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix}$

If $\begin{vmatrix} 3+\sin\theta & 1-\cos\theta \\ 4 & \sin\theta \end{vmatrix} = \text{zero}$, then the value of $\theta = \dots\dots\dots\dots$

(a) π (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{3}$ (d) $\frac{\pi}{4}$

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

(a) 3 or – 2 (b) – 3 or 2 (c) 3 or 2 (d) – 3 or – 2

If $\dfrac{x}{\begin{vmatrix} 3 & 7 \\ 5 & 6 \end{vmatrix}} = \dfrac{y}{\begin{vmatrix} 7 & 4 \\ 6 & 1 \end{vmatrix}} = \dfrac{1}{\begin{vmatrix} 3 & 4 \\ 5 & 1 \end{vmatrix}}$, then $x + y = \dots\dots\dots\dots$

(a) – 2 (b) – 1 (c) 1 (d) 2

If $\begin{vmatrix} 3 & 1 \\ 1 & 0 \end{vmatrix} \times \begin{pmatrix} x & 2y \\ 0 & z \end{pmatrix} + I = \begin{pmatrix} 3 & 0 \\ 1 & 2 \end{pmatrix}^t$, then $x \times y \times z = \dots\dots\dots\dots$

(a) 1 (b) – 1 (c) 2 (d) 4

If $\begin{vmatrix} 2x & 0 & 0 \\ 1 & 3x & 0 \\ 2 & 4 & -x \end{vmatrix} = 48$, then the value of $x = \dots\dots\dots\dots$

(a) 2 (b) – 2 (c) 3 (d) – 3

If $\begin{vmatrix} a & b & c \\ d & e & f \\ x & y & z \end{vmatrix} = 12$, then $\begin{vmatrix} a & d & x \\ b & e & y \\ c & f & z \end{vmatrix} = \dots\dots\dots\dots$

(a) – 12 (b) 12 (c) zero (d) 24

If $\begin{vmatrix} x & y & z \\ a & b & c \\ 2 & -1 & 8 \end{vmatrix} = 10$, then $\begin{vmatrix} 2a & 2b & 2c \\ x & y & z \\ 4 & -2 & 16 \end{vmatrix} = \dots\dots\dots\dots$

(a) – 40 (b) – 20 (c) – 10 (d) 0

If A (3 , 5) , B (2 , 0) and C (– 3 , 3)

, then the area of Δ ABC equals .... square units.

(a) 28 (b) 14 (c) 7 (d) 2

If the area of the triangle whose vertices are (k , 0) , (4 , 0) , (0 , 2) equals 4 square units , then k = ...

(a) zero or 8 (b) – 4 or 4 (c) zero or – 8 (d) 8 or – 8

If L , M are the two roots of the equation : $x^2 - 7x + 2 = 0$, then the value of

$\begin{vmatrix} L^2 M & -L^2 \\ M^2 & M \end{vmatrix} =$ ....

(a) zero (b) 4 (c) 8 (d) 16

If A is a square matrix of order 2 × 2 and | 2 A | = 8 , then | 3 A | = ...

(a) 9 (b) 12 (c) 18 (d) 24

The system of equations $a_1 x + b_1 y = c_1$, $a_2 x + b_2 y = c_2$

If $\begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix} = 5$, $\begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix} = -10$, $\begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix} = 15$

, then $(x , y) =$ ....

(a) (– 2 , 3) (b) (3 , – 2) (c) (– 50 , 75) (d) (75 , – 50)

By solving the system of equations : $2x + 3y - z = 1$, $3x + 5y + 2z = 8$

and $x - 2y - 3z = -1$ the value of $\frac{\Delta_x}{\Delta} =$ ....

(a) – 1 (b) 2 (c) – 2 (d) 3

If the matrix $\begin{pmatrix} x & 2 \\ 9 & x-3 \end{pmatrix}$ has no multiplicative inverse , then $x \in$ ....

(a) R – {– 3 , 6} (b) R – {0 , 3} (c) {0 , 3} (d) {– 3 , 6}

If $X = \begin{pmatrix} 2 & 4 \\ 0 & 1 \end{pmatrix}$, then $X^{-1} =$ ....

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

If $A = \begin{pmatrix} x & 2 \\ y & -2 \end{pmatrix}$, $A \times A^{-1} = A^2$, then $x \times y =$ ....

(a) – 3 (b) – 2 (c) 2 (d) 3

If $B = \begin{pmatrix} 2 & 4 \\ 3 & 1 \end{pmatrix}$ and AB = I , then A = ...

(a) $\frac{1}{10}\begin{pmatrix} -1 & 4 \\ 3 & -2 \end{pmatrix}$ (b) $\frac{-1}{10}\begin{pmatrix} -1 & 4 \\ 3 & -2 \end{pmatrix}$ (c) $\frac{-1}{10}\begin{pmatrix} -2 & 4 \\ 3 & -1 \end{pmatrix}$ (d) $\begin{pmatrix} 7 & 4 \\ -2 & 6 \end{pmatrix}$

When solving the two equations : $a x + b y = 4$, $c x + d y = 2$ its found that the multiplicative inverse of the matrix $\begin{pmatrix} a & b \\ c & d \end{pmatrix} = \begin{pmatrix} -1 & 3 \\ 1 & -2 \end{pmatrix}$, then $2 x + 3 y =$ ....

(a) 2 (b) 3 (c) 4 (d) – 2

The point which belongs to the solution set of the inequality :

$x > 3$, $y < 1$, $x + y \le 5$ is ....

(a) (6 , – 2) (b) (1 , – 2) (c) (4 , 4) (d) (3 , – 2)

The region representing the solution set of the two inequalities : $y > 0$, $x < 0$ in $\mathbb{R} \times \mathbb{R}$ in the quadrant ....

(a) first. (b) second. (c) third. (d) fourth.

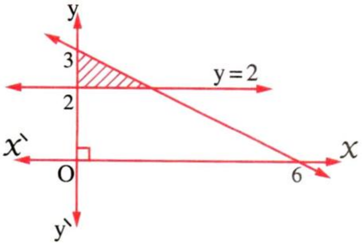
If the point (– 1 , 3) is belong to the solution set of the inequality $x + y \ge k$, then ....

(a) $k \ge 2$ (b) $k \le 2$ (c) $k > 2$ (d) $k < 2$

The shaded area in the opposite figure represents the solution set of : $x \ge 0$, $y \ge 2$ and ....

(a) $x + 2y - 6 \le 0$ (b) $x + 2y + 6 \le 0$

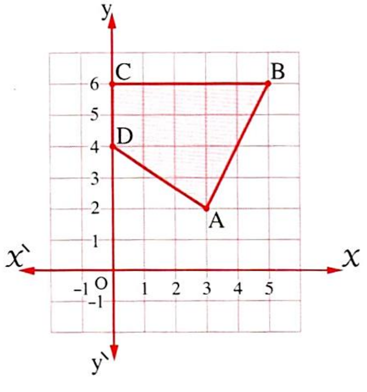
(c) $5x + 2y - 6 \ge 0$ (d) $x + 2y + 6 \ge 0$



The opposite figure represents the solution set of a system of inequalities , then the smallest value of the objective function $P = 3x + 2y$ is ....

(a) 6 (b) 8

(c) 12 (d) 13



Best wishes

Mr. Michael Gamil