

Quiz Algebra of Matrices | Playing a Game - Quizlet

2/25 5777 0019

$$\left[\begin{array}{ccc|c} 1 & -3 & 1 & -5 \\ 0 & 1 & 0 & 4 \\ 0 & 0 & -6 & -36 \end{array} \right]$$

What step should be next to put into Row Echelon form?

1 Mult. R2 by -3 and add to R1

2 Divide R3 by -6

3 Add R3 to R2

4 Mult. R1 by 0

Divide R3 by -6

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$$\left[\begin{array}{ccc|c} 1 & 3 & 2 & 4 \\ 2 & 0 & 1 & 3 \\ 5 & 2 & 2 & 1 \end{array} \right]$$

What is an appropriate row command to solve this by Gaussian Elimination?

1 R3 + R2 -> R3

2 2R1 + R2 -> R2

3 -2R1 + R2 -> R2

4 2R2 + R2 -> R2

-2R1 + R2 -> R2

$$A = \begin{bmatrix} 13 & 2 \\ 20 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 6 \\ 13 & 15 \end{bmatrix}$$

Find $A - B$.

$$\begin{bmatrix} 9 & -3 \\ 7 & -9 \end{bmatrix}$$

$$\begin{bmatrix} 8 & -4 \\ 7 & -9 \end{bmatrix}$$

$$\begin{bmatrix} 18 & 8 \\ 33 & 19 \end{bmatrix}$$

Not possible

8-4

7-9

What must be true in order to ADD two matrices?

The determinant can't equal 0.

The column of the 1st must equal the row of the 2nd.

The size must be equal.

They must be square.

The size must be equal

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

Add

$$\begin{bmatrix} 3 & 2 \\ -6 & -6 \end{bmatrix}$$

$$\begin{bmatrix} 10 & 8 \\ -6 & 2 \end{bmatrix}$$

$$\begin{bmatrix} 11 & 8 \\ -4 & 2 \end{bmatrix}$$

$$\begin{bmatrix} -3 & 2 \\ -4 & -6 \end{bmatrix}$$

11 8
-4 2

$$A = \begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$$

What is A^{-1} ?

$$\begin{pmatrix} \frac{2}{5} & -\frac{1}{5} \\ -\frac{3}{5} & \frac{4}{5} \end{pmatrix}$$

$$\begin{vmatrix} 4 & 5 & 2 \\ -3 & 1 & 1 \\ 5 & 1 & -3 \end{vmatrix}$$

$$\begin{pmatrix} -1 & 2 \\ 1 & 0 \end{pmatrix}$$

$$\begin{bmatrix} -2 & 4 \\ 4 & -4 \end{bmatrix}$$

$$\therefore \begin{pmatrix} \frac{2}{5} & -\frac{1}{5} \\ -\frac{3}{5} & \frac{4}{5} \end{pmatrix}$$

$$\begin{bmatrix} x & 3 \\ \frac{y}{4} & 6 \end{bmatrix} = \begin{bmatrix} 2y & 9z \\ 2 & 6 \end{bmatrix}$$

Use what you know about matrix equality to solve for the variables.

$x = 4$
 $y = 2$
 $z = 3$

Not possible

$x = 4$
 $y = \frac{1}{2}$
 $z = 2$

$x = 16$
 $y = 8$
 $z = 3$

$x = 16, y = 8, z = 3$

$$\left[\begin{array}{ccc|c} 1 & 0 & 1 & -3 \\ 0 & 1 & -1 & 2 \\ 0 & 0 & 2 & 10 \end{array} \right]$$

Solve!

$(-8, 7, 5)$

$(-3, 2, 5)$

$(2, 7, 5)$

$(-8, 2, 5)$

$-8, 7, 5$

$A = \begin{bmatrix} 3 & 4 \\ 2 & 6 \end{bmatrix}$
 $B = \begin{bmatrix} 5 & 2 \\ 3 & 1 \end{bmatrix}$
 $C = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$

Find $A + B - C$.

Not possible
 $\begin{bmatrix} -5 & 2 \\ -1 & 2 \end{bmatrix}$
 $\begin{bmatrix} 5 & 6 \\ 5 & 4 \end{bmatrix}$
 $\begin{bmatrix} 11 & 6 \\ 5 & 10 \end{bmatrix}$

5,6

5,4

What is the name of each entry of a matrix?

Element
 Numbers
 Row
 Dimension

Element

3-6

4-7

-

0-2

-4 6

Subtract

3-4

8-13

3-8

-8 1

3-8

0-1

-3 8

0 1

3-4
8-13

How many rows are in a 7 x 3 matrix?

10

3

21

7

7

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

Multiply

$$\begin{bmatrix} 1 & 8 & 3 \\ 11 & 4 & 5 \end{bmatrix}$$

$$\begin{bmatrix} 20 & 15 & -10 \\ 30 & -5 & 0 \end{bmatrix}$$

$$\begin{bmatrix} 20 & -15 & 10 \\ -30 & 5 & 0 \end{bmatrix}$$

$$\begin{bmatrix} -20 & 15 & -10 \\ 30 & -5 & 0 \end{bmatrix}$$

-20 15 -10
30 -5 0

$$\left[\begin{array}{ccc|c} 1 & 1/3 & 1/4 & 1/3 \\ 0 & 1 & 4 & 2 \\ 0 & 0 & 1 & 6 \end{array} \right]$$

This is an example of

Really Reduced Echelon Form

Row Echelon Form

Reduced Row Echelon Form

Really Really Easy Form

Row echelon Form

$$\begin{bmatrix} 6 & -8 \\ -3 & 4 \end{bmatrix}$$

Determine if the matrix has an inverse, if so find it.

No

0 1
-1 2

2 -1
-1 1

-1 3
1 -2

No

$$A = \begin{bmatrix} 2 & 5 \\ 7 & 0 \end{bmatrix}$$

$$B = \begin{bmatrix} 6 & 5 \\ 1 & 1 \end{bmatrix}$$

Find B-A

not possible because rows do not match columns

1 0
1 -4

-3 1
7 -1

4 0
-6 1

4 0
-6 1

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

Determine if the matrix has an inverse, if so find it.

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

No

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

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

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

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$$

What are the dimensions of this matrix?

$$6 \times 1$$

$$2 \times 3$$

$$1 \times 6$$

$$3 \times 2$$

$$3 \times 2$$

-2

0

3

6

-

7

-8

0

4

Subtract

-9
8
3
2

-5
-8
3
10

5
-8
3
10

-5
8
3
2

-9 8 3 2

When you multiply a matrix by the Identity matrix, you obtain the

transpose matrix.

Identity matrix

original matrix.

inverse matrix.

Original

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

What is the value of element a_{23} ?

1

-1

6

2

-1

$$\begin{pmatrix} x-2 & 3 \\ -2 & 3y \end{pmatrix} = \begin{pmatrix} 1 & 3 \\ -2 & 15 \end{pmatrix}$$

Find the value of x and y if they are equal matrices.

x=3, y=5

x=3, y=3

x=2, y=5

x=5, y=3

X=3 y=5

$$4 \begin{bmatrix} r \\ -2s \end{bmatrix} + 2 \begin{bmatrix} -2r \\ s \\ 2t \end{bmatrix} = \begin{bmatrix} 3 \\ 2 \\ 1 \end{bmatrix}$$

Use what you know about matrix equality to find r, s, and t.

Not possible

$$\begin{aligned} r &= 0 \\ s &= \frac{1}{2} \\ t &= \frac{1}{2} \end{aligned}$$

$$\begin{aligned} r &= 0 \\ s &= -3 \\ t &= 0 \end{aligned}$$

$$\begin{aligned} r &= 4 \\ s &= 1 \\ t &= 0 \end{aligned}$$

Not possible

$$\begin{array}{l} \left[\begin{array}{ccc|c} 1 & 2 & \frac{1}{2} & 4 \\ 0 & 1 & 4 & 6 \\ 0 & 3 & \frac{1}{2} & \frac{1}{3} \end{array} \right] \\ \frac{1}{3} R_3 \rightarrow R_3 \\ \left[\begin{array}{ccc|c} 1 & 2 & \frac{1}{2} & 4 \\ 0 & 1 & 4 & 6 \\ 0 & 0 & \frac{1}{6} & \frac{1}{3} \end{array} \right] \end{array}$$

Aina is simplifying the matrix using Gaussian Elimination. Did she complete the step correctly?

No. Just punch in the calculator. Who cares about Carl Gauss

No, she should have changed the 2 to a zero and multiplied -2 by R2 and added R1

No, she wanted to change the 3 to a zero so she should have multiplied R2 and added it to R3

Yes. When you need a zero you multiply by the number's reciprocal.

no, she wanted to change the 3

$\begin{bmatrix} 2 & 6 \\ -3 & 5 \\ -1 & 4 \end{bmatrix} * \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$	Multiply.		
$\begin{bmatrix} 14 & 7 & 7 \\ 26 & 3 & 8 \end{bmatrix}$	$\begin{bmatrix} 14 & 26 \\ 7 & 3 \\ 8 & 7 \end{bmatrix}$	undefined	$\begin{bmatrix} 14 & 26 \\ 7 & 3 \\ 7 & 8 \end{bmatrix}$

$A = \begin{bmatrix} 3 & 4 \\ 2 & 6 \end{bmatrix} \quad B = \begin{bmatrix} 5 & 2 \\ 3 & 1 \end{bmatrix} \quad C = \begin{bmatrix} 3 & 0 \\ 0 & 3 \end{bmatrix}$	Find $2A - B + 3C$.		
Not possible	$\begin{bmatrix} 20 & 10 \\ 7 & 22 \end{bmatrix}$	$\begin{bmatrix} 1 & 2 \\ -1 & 8 \end{bmatrix}$	$\begin{bmatrix} 10 & 6 \\ 1 & 20 \end{bmatrix}$

10 6 1 20

$$\left[\begin{array}{ccc|c} 2 & 4 & 0 & 2 \\ 6 & 5 & 1 & 1 \\ 3 & 9 & 6 & 6 \end{array} \right]$$

This is an example of a

Reduced Row Echelon Form

System of Quadratic Equations

Row Echelon Form

Augmented Matrix

$$\mathbf{R} = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9.01 \end{bmatrix}$$

In Matrix R (pictured) what element is r_{23} ?

1

6

9.01

8

$$\left[\begin{array}{ccc|c} 1 & -6 & 5 & 3 \\ -1 & 7 & -3 & 2 \\ 0 & 0 & 1 & 4 \end{array} \right]$$

Write the augmented matrix in row echelon form.

$$\left[\begin{array}{ccc|c} 0 & -6 & 5 & 3 \\ 1 & 0 & 2 & 5 \\ 1 & 1 & 0 & 4 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -6 & 5 & 3 \\ 0 & 1 & 2 & 5 \\ 0 & 0 & 1 & 4 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -6 & 2 & 3 \\ 0 & 1 & 2 & 4 \\ 0 & 0 & 1 & 2 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -6 & 5 & 3 \\ -1 & 0 & 2 & 8 \\ 0 & 0 & 1 & 4 \end{array} \right]$$

1 -6 5 3

0 1 2 5

0 0 1 4

$$\begin{bmatrix} 10 & 5 \\ 2 & -4 \\ -8 & 3 \end{bmatrix} + \begin{bmatrix} 2 & 5 & 4 \\ 3 & 7 & 1 \end{bmatrix}$$

Can the operation be performed?

No

$$\begin{bmatrix} 2x \\ 4 \end{bmatrix} + \begin{bmatrix} 5 \\ 3y \end{bmatrix} = \begin{bmatrix} 13 \\ 13 \end{bmatrix}$$

Use what you know about matrix equality to find x and y.

$$\begin{aligned} x &= 9 \\ y &= 3 \end{aligned}$$

$$\begin{aligned} x &= 2 \\ y &= 0 \end{aligned}$$

$$\begin{aligned} x &= 4 \\ y &= 0 \end{aligned}$$

$$\begin{aligned} x &= 4 \\ y &= 3 \end{aligned}$$

$$X = 4$$

$$Y = 3$$

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

$-6R_1 + R_3 \rightarrow R_3$

$$\begin{bmatrix} 1 & 2 & 6 & 7 \\ 0 & 3 & 5 & 9 \\ 0 & -12 & -32 & -38 \end{bmatrix}$$

Johnny was using Gaussian Elimination to simplify the matrix. What did he do wrong in this step?

He added the numbers incorrectly

Nothing. This step was correct.

To get a zero for a number, you should multiply the same row by its' reciprocal

If you multiply a number to a row you have to change that row too

Nothing, this step was correct

$$\left[\begin{array}{ccc|c} 2 & 4 & 0 & 2 \\ 6 & 5 & 1 & 1 \\ 3 & 9 & 6 & 6 \end{array} \right]$$

This is an example of a

Augmented Matrix

Augmented