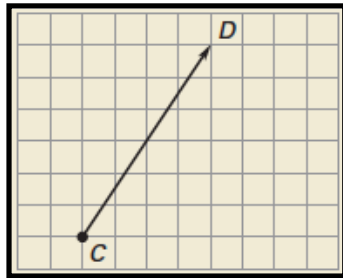


Bellwork

02/15/2012

1. Name the vector and write it in component form.



2. Use the point $M(8,-2)$. Find the component form of the vector that describes the translation to $M'(7,5)$.

Geometry
9.2 Use Properties of Matrices
Standard(s): 9, 10

Vocabulary:

Matrix: A rectangular arrangement of numbers in rows and columns.

$$\begin{bmatrix} 2 & 6 & -8 \\ 1 & 0 & 4 \end{bmatrix}$$

Element: Each number in a matrix.

$$\begin{bmatrix} 2 & 6 & -8 \\ 1 & 0 & 4 \end{bmatrix}$$

Dimensions: The numbers of rows by the columns.

$$\begin{bmatrix} 2 & 6 & -8 \\ 1 & 0 & 4 \end{bmatrix}$$

To Add or Subtract Matrices:

Add or subtract corresponding elements.

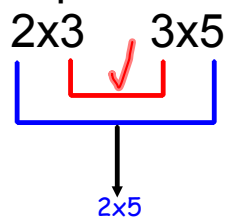
Note: The matrices must have the same dimensions.

To Multiply Matrices:

Multiply the rows of the first matrix times the columns of the second matrix

Note: The matrices don't have to have the same dimensions.

The Multiplication Check



The Basics of Matrices

Find the dimensions of the matrices. Tell which matrices *could* be added together.

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

$$\begin{bmatrix} 9 & -1 \\ 3 & 4 \\ -2 & 6 \end{bmatrix}$$

$$[0]$$

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

Matrices can be created using any set of data!

For example, I can create a matrix using 3 students and their past two test grades!

	Test #1	Test #2
Student 1	98	76
Student 2	53	68
Student 3	74	81

$$\begin{bmatrix} 98 & 76 \\ 53 & 68 \\ 74 & 81 \end{bmatrix}$$

or you could write it like this...

	Student 1	Student 2	Student 3
Test #1	98	53	74
Test #2	76	68	81

$$\begin{bmatrix} 98 & 53 & 74 \\ 76 & 68 & 81 \end{bmatrix}$$

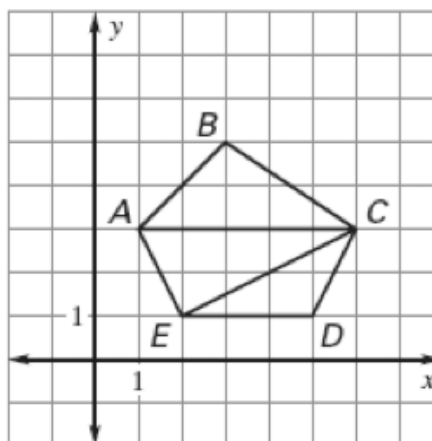
Writing Matrices

Use the diagram to write a matrix to represent the polygon.

Point C

$\triangle ABC$

Quadrilateral ACDE



A(1,3)

B(3,5)

C(6,3)

D(5,1)

E(2,1)

Add or Subtract Matrices

Add or subtract.

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

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

$$\begin{bmatrix} 7 & 2 \\ -5 & 9 \end{bmatrix} + \begin{bmatrix} -8 & 1 \\ 4 & 0 \end{bmatrix}$$

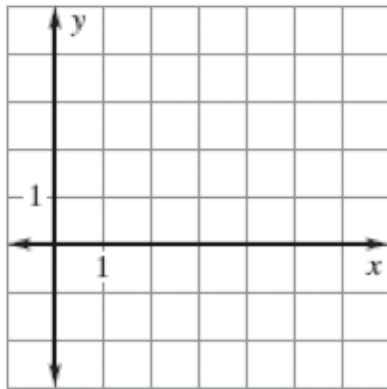
$$\begin{bmatrix} 2 & 3 & 5 \\ 7 & -1 & 8 \end{bmatrix} - \begin{bmatrix} 12 & -2 & 1 \\ 6 & 3 & -4 \end{bmatrix}$$

Represent a Translation Using Matrices

Find the image matrix that represents the translation of the polygon. Then graph the polygon and its image.

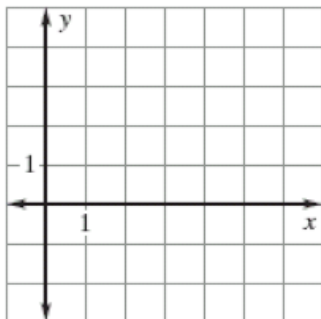
2 units right, 2 units up

$$\begin{array}{ccc} A & B & C \\ \left[\begin{array}{ccc} -2 & 0 & 1 \\ 1 & 4 & -3 \end{array} \right] \end{array}$$



2 units down

$$\begin{array}{ccc} D & E & F \\ \left[\begin{array}{ccc} 2 & 5 & 4 \\ 3 & 1 & 4 \end{array} \right] \end{array}$$



Homework Assignment

Pg. 584 #1, 3-17

Pop Quiz

Get out a scrap sheet of paper.

1. What are the numbers in a matrix called?
2. What is the dimension of the given matrix?

$$[1 \ 2 \ 3 \ 4]$$

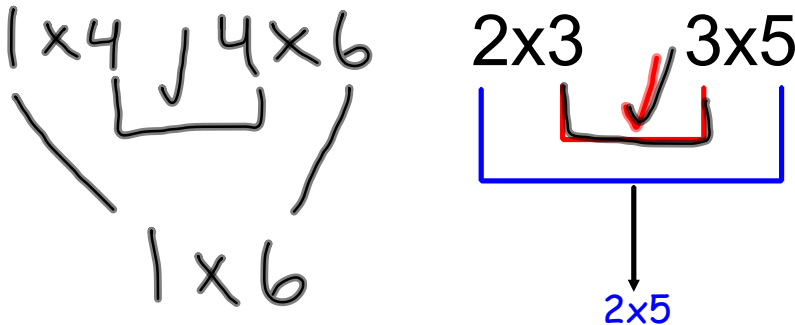
3. Three dogs are weighed at a veterinarian's office. Dog #1 weighs 9 lbs. Dog #2 weighs 18 lbs. Dog #3 weighs 25 pounds. Write the data as a matrix. (*remember: there are two different ways you could write this.*)

Geometry
9.2, Part 2 Multiply Matrices
Standard(s): 9, 10

Vocabulary:

Defined Product: it is possible to multiply two matrices.

The Multiplication Check



To Multiply Matrices:

Multiply the rows of the first matrix times the columns of the second matrix

Note: The matrices don't have to have the same dimensions.

Checking for Defined Products

Is the product AB defined? If so, tell the dimensions.

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

Handwritten dimensions and arrows:

2×3 (under A) and 3×2 (under B) are connected by a downward arrow to 2×2 (under the product AB). A bracket connects the 3 in 2×3 and the 3 in 3×2 .

$$A = \begin{bmatrix} 2 & 7 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 1 \\ 4 & -7 \end{bmatrix}$$

Handwritten dimensions and arrows:

1×3 (under A) and 2×2 (under B) are connected by a bracket that ends in an 'X', indicating the product is not defined.

Multiplying Matrices

Use the multiplication check to find the products dimension. Then multiply.

$$\begin{array}{c}
 2 \times 2 \\
 \begin{bmatrix} 3 & -5 \\ 1 & 4 \end{bmatrix} \begin{bmatrix} 2 & -1 \\ 0 & 6 \end{bmatrix} \\
 \begin{array}{l}
 \overset{6}{3(2)} + \overset{0}{-5(0)} \\
 \overset{-3}{3(-1)} + \overset{-30}{-5(6)} \\
 \overset{2}{1(2)} + \overset{0}{4(0)} \\
 \overset{-1}{1(-1)} + \overset{24}{4(6)}
 \end{array} \\
 \begin{bmatrix} 6 & -33 \\ 2 & 23 \end{bmatrix}
 \end{array}$$

$$\begin{array}{c}
 2 \times 2 \\
 \begin{bmatrix} 5 & 1 \\ 1 & -1 \end{bmatrix} \begin{bmatrix} 2 & -4 \\ 5 & 1 \end{bmatrix} \\
 \begin{array}{l}
 \overset{10}{5(2)} + \overset{5}{1(5)} \\
 \overset{-20}{5(-4)} + \overset{1}{1(1)} \\
 \overset{2}{1(2)} + \overset{-5}{-1(5)} \\
 \overset{-4}{1(-4)} + \overset{-1}{-1(1)}
 \end{array} \\
 \begin{bmatrix} 15 & -19 \\ -3 & -5 \end{bmatrix}
 \end{array}$$

$$\begin{array}{c}
 1 \times 2 \quad 2 \times 1 \\
 \begin{bmatrix} 5 & 1 \end{bmatrix} \begin{bmatrix} -3 \\ -2 \end{bmatrix} \quad 1 \times 1 \\
 \overset{-15}{5(-3)} + \overset{-2}{1(-2)} \\
 \begin{bmatrix} -17 \end{bmatrix}
 \end{array}$$

Homework Assignment

Worksheet 9.2B

