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Help

VECTOR ARITHMETIC



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EXAMPLE - VECTOR ARITHMETIC

Below are three vectors. Use the the MATLAB code box to help you answer the questions below.

```
1 % Use the vectors below to help you answer the questions.
2 x = 1:5;
3 y = -2:2;
4 z = -1:0.1:1;
```

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```
5 result = x.*y
6
7
```

Unanswered

result =


-2 -2 0 4 10

Run Code

Check

## VECTOR MULTIPLICATION

What is the result of  $x*y$ ?

- ☐ 10
- ☒ A MATLAB error 
- ☐ the row vector [-2, -2, 0, 4, 10]
- ☐ a column vector [-2; -2; 0; 4; 10]

### EXPLANATION

The '\*' operator performs matrix multiplication. Because  $x$  and  $y$  are both row vectors, they cannot be multiplied together according to the rules of linear algebra and MATLAB returns an error.

Check

Hide Answer

## POINTWISE MULTIPLICATION

Often we need to multiply each element of a vector by the corresponding element in another vector. For example, I want a vector  $[x(1)*y(1), x(2)*y(2), \dots, x(5)*y(5)]$ .

What MATLAB code below produces this result?

- ☒  $x.*y$  ✓
- ☐  $x*y$
- ☐ You must use a FOR loop to do this.

**EXPLANATION**

The `.*` operator performs element-wise multiplication. You can also use `./` and `.^` for element-wise division and exponentiation.

Check

Hide Answer

**VALID MATLAB OPERATORS**

Test out the MATLAB commands below to determine which commands are valid and which commands return an error.

Check all valid MATLAB operations

- ☐  $z^3$
- ☒  $z.^3$  ✓
- ☐  $x + z$
- ☒  $x + y$  ✓
- ☒  $3*x$  ✓
- ☐  $y.*z$
- ☐  $y./z$
- ☒  $y./x$  ✓
- ☒  $y/3$  ✓

**EXPLANATION**

To perform element-wise operations, the two vectors must have the same number of elements. However, when multiplying or dividing by a scalar, MATLAB internally expands the scalar to perform the element-wise operation.

Check

Hide Answer





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