Activity 27   Matrix arithmetic

Aim: Perform matrix calculations on ClassPad.

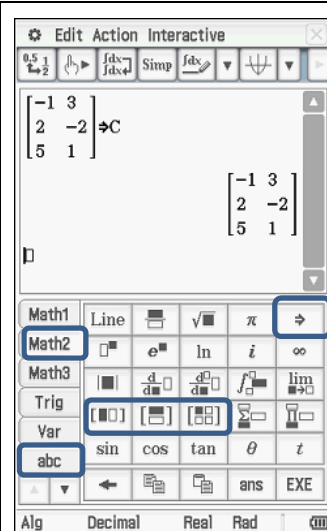
Enter and store the matrices

$$\mathbf{A} = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix} \mathbf{B} = \begin{bmatrix} 1 & 5 \\ 2 & 3 \end{bmatrix}, \ \mathbf{C} = \begin{bmatrix} -1 & 3 \\ 2 & -2 \\ 5 & 1 \end{bmatrix}, \ \mathbf{D} = \begin{bmatrix} 1 & 2 & -2 \\ 4 & 2 & -1 \\ 3 & -1 & 2 \end{bmatrix}$$

- Tap $\sqrt{\alpha}$ (Main)
- Press ⌈Keyboard⌉ , tap ⌈Math2⌉

Enter matrix C

- Tap ⌈▦⌉
- Tap ⌈▤⌉
- Enter the values using the arrow keys to navigate between elements
- Tap ⇒, tap ⌈abc⌉
- Tap ⬆, tap C
- Press ⌈EXE⌉
- Tap ⌈↰⌉ to go back to the Math menu

Repeat for matrices A, B, and D

Perform the following calculations (if possible), and record the output. Where a calculation is not possible, explain why.

1. A + B   3. 2B

2. 3A   4. 2B + 3A

5. **A + C**

10. **D×C**

6. **B** + 2**D**

11. **C×D**

7. **A×B**

12. **A**^{2}

8. **B×A**

13. **C** – B×A

9. **BC**

14. **B**$^{-1}$**×B**

Learning notes

Matrices can only be added (or subtracted) when they have the same size, i.e. the same number of rows and the same number of columns.

For multiplication the number of columns in the first matrix must be the same as the number of rows in the second matrix. A reason for defining matrix multiplication in this way is demonstrated in the next activity.