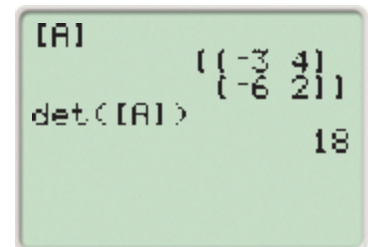


4-4 Determinants and Cramer's Rule

Every square matrix has an associated value called its *determinant*. You can use a calculator to find this value.

To find the determinant of a square matrix that you have already entered into your calculator, press **2nd** ^{MATRIX} **x⁻¹**, scroll to the right to **MATH**, and select **1:det(**. Then enter the name of the matrix by pressing **2nd** ^{MATRIX} **x⁻¹** and selecting the matrix from the list.



Close the parentheses and press **ENTER**.

Use your calculator to find the determinant of each matrix. Look for patterns.

1. $\begin{bmatrix} 3 & 0 \\ 0 & 10 \end{bmatrix}$

2. $\begin{bmatrix} 3 & 1 \\ 5 & 10 \end{bmatrix}$

3. $\begin{bmatrix} 3 & 2 \\ 5 & 10 \end{bmatrix}$

4. $\begin{bmatrix} 2 & 3 \\ 10 & 5 \end{bmatrix}$

5. $\begin{bmatrix} 2 & 1 \\ 10 & 5 \end{bmatrix}$

6. $\begin{bmatrix} 1 & 3 \\ -2 & 10 \end{bmatrix}$

THINK AND DISCUSS

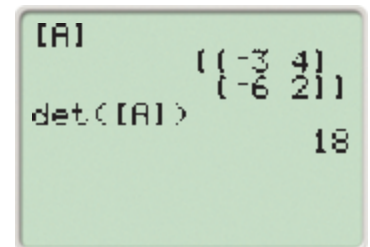
7. **Describe** how the determinant is related to the entries of a 2×2 matrix.

8. **Explain** how you can find the determinant of $\begin{bmatrix} 2 & 1 \\ 10 & 5 \end{bmatrix}$ without using a calculator.

4-4 Determinants and Cramer's Rule

Every square matrix has an associated value called its *determinant*. You can use a calculator to find this value.

To find the determinant of a square matrix that you have already entered into your calculator, press **2nd** ^{MATRIX} **x⁻¹**, scroll to the right to **MATH**, and select **1:det(**. Then enter the name of the matrix by pressing **2nd** ^{MATRIX} **x⁻¹** and selecting the matrix from the list.



Close the parentheses and press **ENTER**.

Use your calculator to find the determinant of each matrix. Look for patterns.

1. $\begin{bmatrix} 3 & 0 \\ 0 & 10 \end{bmatrix}$ 30

2. $\begin{bmatrix} 3 & 1 \\ 5 & 10 \end{bmatrix}$ 25

3. $\begin{bmatrix} 3 & 2 \\ 5 & 10 \end{bmatrix}$ 20

4. $\begin{bmatrix} 2 & 3 \\ 10 & 5 \end{bmatrix}$ -20

5. $\begin{bmatrix} 2 & 1 \\ 10 & 5 \end{bmatrix}$ 0

6. $\begin{bmatrix} 1 & 3 \\ -2 & 10 \end{bmatrix}$ 16

THINK AND DISCUSS

7. **Describe** how the determinant is related to the entries of a 2×2 matrix.

8. **Explain** how you can find the determinant of $\begin{bmatrix} 2 & 1 \\ 10 & 5 \end{bmatrix}$ without using a calculator.

7. The determinant of a 2×2 matrix is the difference of the products of the diagonals.

8. The determinant is $3(6) - 10(1) = 18 - 10 = 8$.