## Determinants of 3×3 Matrices

**Evaluate the determinant of each matrix.** 

$$\begin{array}{c|cccc}
3 & -2 & 1 \\
3 & -1 & -2 \\
3 & -2 & -3
\end{array}$$

$$\begin{array}{ccccc}
 -3 & 2 & -3 \\
 0 & -1 & -1 \\
 3 & 0 & -3
\end{array}$$

**Evaluate each determinant.** 

7) 
$$\begin{vmatrix} 3 & 4 & 5 \\ -4 & 6 & 3 \\ 1 & -4 & 3 \end{vmatrix}$$

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

$$\begin{array}{c|cccc}
 -5 & 5 & 5 \\
 -8 & 9 & -3 \\
 8 & 5 & 9
\end{array}$$

11) 
$$\begin{vmatrix} 0 & a & b \\ 0 & c & d \\ 0 & x & y \end{vmatrix}$$

12) What value of 
$$x$$
 makes the determinant  $-4$ ?
$$\begin{vmatrix}
-2 & 0 & 0 \\
-6 & x & 1 \\
-4 & 0 & -1
\end{vmatrix}$$

## Determinants of 3×3 Matrices

Evaluate the determinant of each matrix.

$$\begin{array}{cccc}
3 & -2 & 1 \\
3 & -1 & -2 \\
3 & -2 & -3
\end{array}$$

$$-12$$

$$2) \begin{bmatrix} -3 & 2 & -3 \\ 0 & -1 & -1 \\ 3 & 0 & -3 \end{bmatrix}$$

$$-24$$

Evaluate each determinant.

$$-161$$

7) 
$$\begin{vmatrix} 3 & 4 & 5 \\ -4 & 6 & 3 \\ 1 & -4 & 3 \end{vmatrix}$$
200

11) 
$$\begin{vmatrix} 0 & a & b \\ 0 & c & d \\ 0 & x & y \end{vmatrix}$$

$$\begin{array}{c|cccc}
-6 & -6 & 1 \\
3 & -5 & -2 \\
4 & 3 & -3
\end{array}$$

-103

$$\begin{array}{c|cccc}
 -2 & 5 & -4 \\
 0 & -3 & 5 \\
 -5 & 5 & -6
\end{array}$$

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

$$\begin{vmatrix}
-5 & 5 & 5 \\
-8 & 9 & -3 \\
8 & 5 & 9
\end{vmatrix}$$

$$-800$$

12) What value of x makes the determinant -4?  $\begin{vmatrix}
-2 & 0 & 0 \\
-6 & x & 1 \\
-4 & 0 & -1
\end{vmatrix}$ 

-2