

## Determinants 4.4



### Overview of Problems

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#### Example Set: A

Find the determinant of the following matrices:

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

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

3.  $\begin{bmatrix} 0 & -9 \\ 2 & 6 \end{bmatrix}$

4.  $\begin{bmatrix} 12 & 4 \\ -6 & 10 \end{bmatrix}$

#### Example Set: B

Evaluate the determinants by expansion:

1.  $\begin{vmatrix} 2 & 0 & 3 \\ 1 & 9 & -1 \\ 4 & 5 & 2 \end{vmatrix}$  expand along row 1

2.  $\begin{vmatrix} 3 & -3 & 0 \\ 1 & 5 & 7 \\ 2 & 6 & 2 \end{vmatrix}$  expand along row 2

3.  $\begin{vmatrix} -2 & -1 & 3 \\ 0 & 2 & 1 \\ -4 & 5 & 2 \end{vmatrix}$  expand along 3

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### Example Set: C

Evaluate the determinants by using the diagonals:

1. 
$$\begin{vmatrix} 6 & 0 & 3 \\ 1 & 5 & 0 \\ 1 & 5 & 2 \end{vmatrix}$$

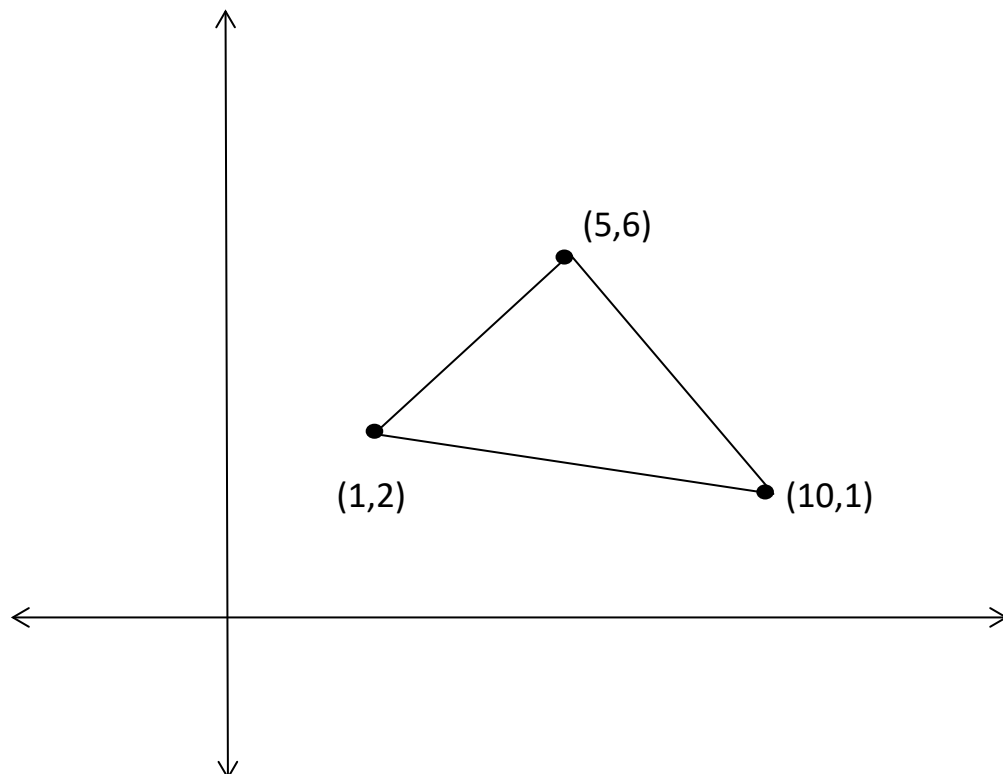
2. 
$$\begin{vmatrix} 3 & -3 & 1 \\ 9 & 5 & 1 \\ 2 & 6 & 2 \end{vmatrix}$$

3. 
$$\begin{vmatrix} 4 & -2 & 0 \\ 0 & 2 & 1 \\ 7 & 5 & 8 \end{vmatrix}$$

### Example Set: D

Find the area of the triangle by using a determinant:

1.



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### Example Set: A - **ANSWER KEY**

Find the determinant of the following matrices:

1.  $\begin{bmatrix} 4 & 3 \\ -1 & 2 \end{bmatrix}$  **11**

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

3.  $\begin{bmatrix} 0 & -9 \\ 2 & 6 \end{bmatrix}$  **18**

4.  $\begin{bmatrix} 12 & 4 \\ -6 & 10 \end{bmatrix}$  **144**

### Example Set: B- **ANSWER KEY**

Evaluate the determinants by expansion:

1.  $\begin{vmatrix} 2 & 0 & 3 \\ 1 & 9 & -1 \\ 4 & 5 & 2 \end{vmatrix}$  expand along row 1 **-47**

2.  $\begin{vmatrix} 3 & -3 & 0 \\ 1 & 5 & 7 \\ 2 & 6 & 2 \end{vmatrix}$  expand along row 2 **-132**

3.  $\begin{vmatrix} -2 & -1 & 3 \\ 0 & 2 & 1 \\ -4 & 5 & 2 \end{vmatrix}$  expand along 3 **-26**

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### Example Set: C-ANSWER KEY

Evaluate the determinants by using the diagonals:

$$1. \begin{vmatrix} 6 & 0 & 3 \\ 1 & 5 & 0 \\ 1 & 5 & 2 \end{vmatrix} \mathbf{60}$$

$$2. \begin{vmatrix} 3 & -3 & 1 \\ 9 & 5 & 1 \\ 2 & 6 & 2 \end{vmatrix} \mathbf{104}$$

$$3. \begin{vmatrix} 4 & -2 & 0 \\ 0 & 2 & 1 \\ 7 & 5 & 8 \end{vmatrix} \mathbf{30}$$



### Example Set: D-ANSWER KEY

Find the area of the triangle by using a determinant:

1.

20 units squared

