

SET BUILDER NOTATION PRACTICE

Write each of the following sets by listing its elements between braces.

1. $\{x : x \in \mathbb{N}, x^2 = 9\}$

2. $\{3x \in \mathbb{Z} : |x| < 4\}$

3. $\{2k + 1 : k \in \mathbb{Z}\}$

4. $\{(x, y) : x \in \{0, 1, 2\}, y \in \{5, 7\}\}$

5. $\left\{ \begin{bmatrix} 1 & a \\ b & 1 \end{bmatrix} : |x| < 1 \right\}$

Write each of the following sets using set builder notation. Multiple correct answers are possible.

1. $\{1, 2, 3\}$

2. $\{3, 6, 9, 12, 15, 18, 21, \dots\}$

3. $\{\dots, -3\pi, -2\pi, -\pi, 0, \pi, 2\pi, 3\pi, \dots\}$

4. $\left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ 2 \end{bmatrix}, \begin{bmatrix} 1 \\ 3 \end{bmatrix}, \begin{bmatrix} 1 \\ 4 \end{bmatrix}, \begin{bmatrix} 1 \\ 5 \end{bmatrix}, \dots \right\}$

CARTESIAN PRODUCT PRACTICE

Let

$$A = \{0, 2, 4\} \quad B = \{m, n\}$$

List the elements in each set:

1. $A \times B$

2. $B \times A$

3. $B \times B \times B$

4. $A \times \emptyset$

Sketch each of the products on the Cartesian plane:

1. $\{1, 2\} \times \{3, 4\}$

3. $[1, 2] \times [1, 2]$

2. $\{1\} \times [2, 3]$

4. $\mathbb{N} \times \mathbb{N}$