

4.7

Representation of a Cartesian Product in the Plane

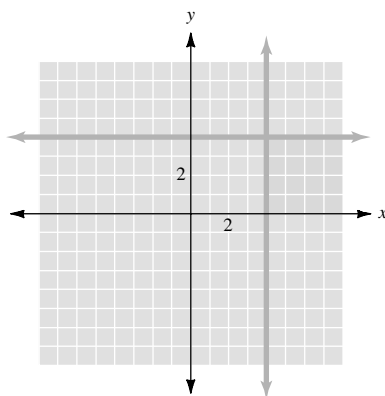
• Example 1

Graph the following Cartesian product in the plane.

$$\{x \in \mathbb{R} \mid x \geq 4\} \times \{y \in \mathbb{R} \mid 0 \leq y \leq 4\}$$

We can graphically represent the set of all ordered pairs (x, y) that result from taking the Cartesian product of the two sets as the intersection of the two regions in the plane determined by the inequalities

$$x \geq 4 \text{ and } 0 \leq y \leq 4.$$



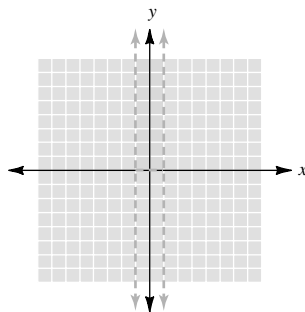
• • • CHECK YOURSELF 1

Graph the following Cartesian product in the plane.

$$\{y \in \mathbb{R} \mid y > 0\} \times \{x \in \mathbb{R} \mid -1 < x < 1\}$$

• • • CHECK YOURSELF ANSWER

1.



4.7 Exercises

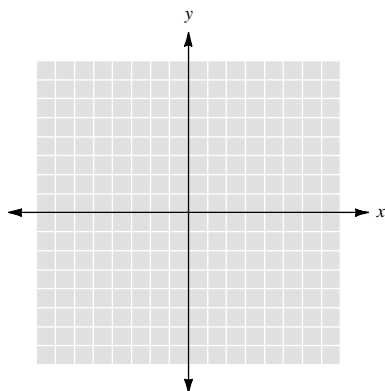
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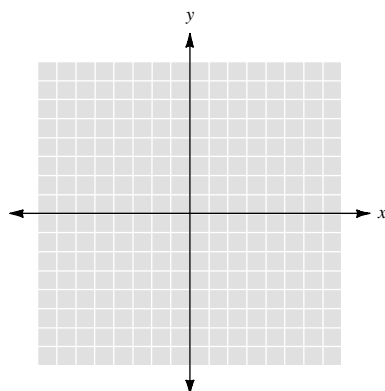
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Graph each of the following Cartesian products in the plane.

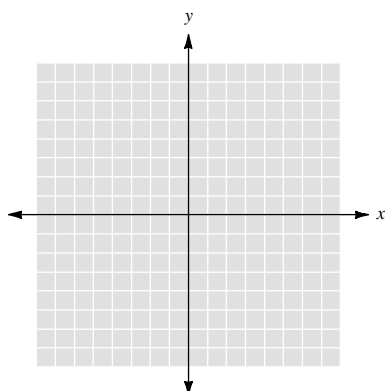
1. $\{x \in \mathbb{R} \mid 0 < x < 5\} \times \{y \in \mathbb{R} \mid -5 < y < 5\}$



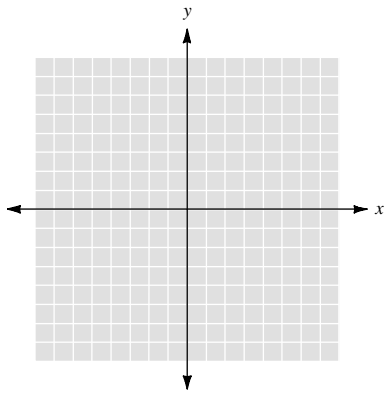
2. $\{x \in \mathbb{R} \mid x \geq -5\} \times \{y \in \mathbb{R}\}$



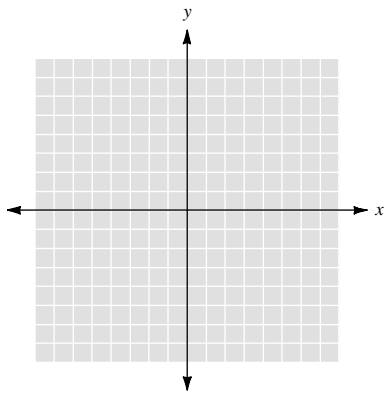
3. $\{y \in \mathbb{R} \mid y < 0\} \times \{x \in \mathbb{R} \mid 0 \leq x < 5\}$



4. $\{y \in \mathbb{R} \mid y < 0\} \times \{x \in \mathbb{R} \mid x \geq 0\}$



5. $\{x \in \mathbb{R} \mid 3 < x \leq 5\} \times \{y \in \mathbb{R} \mid 1 < y < 10\}$



6. $\{y \in \mathbb{R} \mid y < 0\} \times \{x \in \mathbb{R}\}$

