

Relations and Functions Worksheet

- If $x, y \in \{0, 1, 2, 3, 4, 5\}$ Then, which of the following are function in the given set?
 - $f_1 = \{(x, y) : y = x - 1\}$
 - $f_2 = \{(x, y) : x + y < 3\}$
 - $f_3 = \{(x, y) : x > y\}$
 - $f_4 = \{(x, y) : x + y = 4\}$
- Let $A = \{-3, -2, -1, 0, 1, 2, 3\}$ and $B = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$. Consider the rule $f(x) = x^2$. Find domains (f) and range (f).
- A function $f : \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = x^3$. Determine range of f.
- What is the difference between a relation and a function? Is every relation a function? Why?
- Let $A = \{-1, 0, 1, 2\}$ and $B = \{0, 1, 2, 3, 4, 5\}$. Consider a rule $f(x) = x^2$. Find the domain (f) and range (f).

If $A = \{1, 2, 3, 5, 7, 9, 11\}$, $B = \{7, 9, 11, 13\}$, $C = \{11, 13, 15\}$ $D = \{17, 19, 21, 23\}$ and $E = \{1, -1\}$ find

- What is the number of element in $A \times B$
- How many number of relations can be found from $A \times C$
- The mapping defined as $\{(1, 11), \{1, 13\}, \{2, 7\}, \{5, 11\}\}$ is a function from $A \times B$. State True or False.
- The mapping defined as $\{(11, 17), (13, 19), (15, 21), (15, 23)\}$ is a Relation from $C \times D$, State True or False.
- Find the value of $B \times C$ and $C \times B$
- Find the value of $E \times E \times E$
- Verify that $A \times (B \cap C) = (A \times B) \cap (A \times C)$