

EXERCISE 2.2

1. Let $A=\{1,2,3,\dots,14\}$. Define a relation R from A to A by $R=\{(x,y):3x-y=0, \text{ where } x, y \in A\}$. Write down its domain, codomain and range.
2. Define a relation R on the set N of natural numbers by $R=\{(x,y):y=x+5, x \text{ is a natural number less than } 4; x, y \in N\}$. Depict this relationship using roster form. Write down the domain and the range.
3. $A=\{1,2,3,5\}$ and $B=\{4,6,9\}$. Define a relation R from A to B by $R=\{(x,y); \text{ the difference between } x \text{ and } y \text{ is odd}; x \in A, y \in B\}$. Write R in roster form.
4. The Fig2.7 shows a relationship between the sets P and Q . Write this relation: (i) in set-builder form (ii) roster form. What is its domain and range?
5. Let $A=\{1,2,3,4,6\}$. Let R be the relation on A defined by $\{(a,b) \mid a, b \in A \text{ } b \text{ is exactly divisible by } a\}$. (i) Write R in roster form (ii) Find the domain of R (iii) Find the range of R .
6. Determine the domain and range of the relation R defined by $R=\{(x,x+5):x \in \{0,1,2,3,4,5\}\}$.
7. Write the relation $R=\{(x,x^3): x \text{ is a prime number less than } 10\}$ in roster form.
8. Let $A=\{x,y,z\}$ and $B=\{1,2\}$. Find the number of relations from A to B .
9. Let R be the relation on Z defined by $R=\{(a,b): a, b \in Z, a-b \text{ is an integer}\}$. Find the domain and range of R .