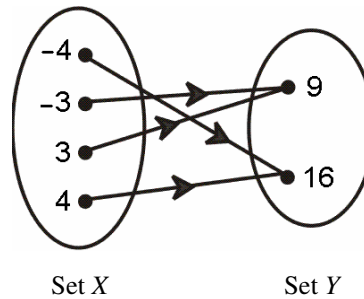


CHAPTER 1: FUNCTIONS

Cloned SPM Question (2006, Paper 1)

In the diagram, set Y shows the images of certain elements of set X .



- State the type of relation between set X and set Y .
- Using the function notation, write a relation between set X and set Y .

Solution

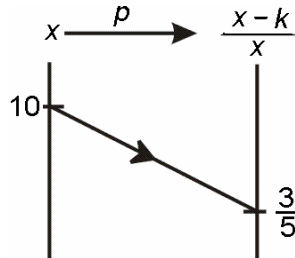
- Many-to-one relation
- $f: x \rightarrow x^2$ or $f(x) = x^2$

Pointers

- Both -3 and 3 are mapped onto one image only, that is, 9 , both -4 and 4 are mapped onto one image, that is, 16 , therefore the type of relation is many-to-one.
- Since $f(-3) = (-3)^2 = 9$, $f(3) = 3^2 = 9$, $f(-4) = (-4)^2 = 16$ and $f(4) = 4^2 = 16$, the notation is $f: x \rightarrow x^2$ or $f(x) = x^2$.

 **Cloned SPM Question (2006, Paper 1)**

The diagram shows the function $p : x \rightarrow \frac{x-k}{x}$, $x \neq 0$, where k is a constant.



Find the value of k .

Solution

$$p(x) = \frac{x-k}{x}, x \neq 0$$

From the diagram, $p(10) = \frac{3}{5}$.

$$\begin{aligned} \text{Thus, } \frac{10-k}{10} &= \frac{3}{5} \\ 10-k &= 6 \\ k &= 4 \end{aligned}$$

Pointers

- From the arrow diagram, we can write $p(10) = \frac{3}{5}$.
- Substitute $x = 10$ into the equation $\frac{x-k}{x} = \frac{3}{5}$ to find the value of k .