WORK SHEET
BASED ON THE FOCUS AREA
FROM CHAPTER 1

1) A function $f : X \longrightarrow Y$ is onto, then the range of f is .....

2) The function $f : N \longrightarrow N$ given by $f(x) = 2x$ is

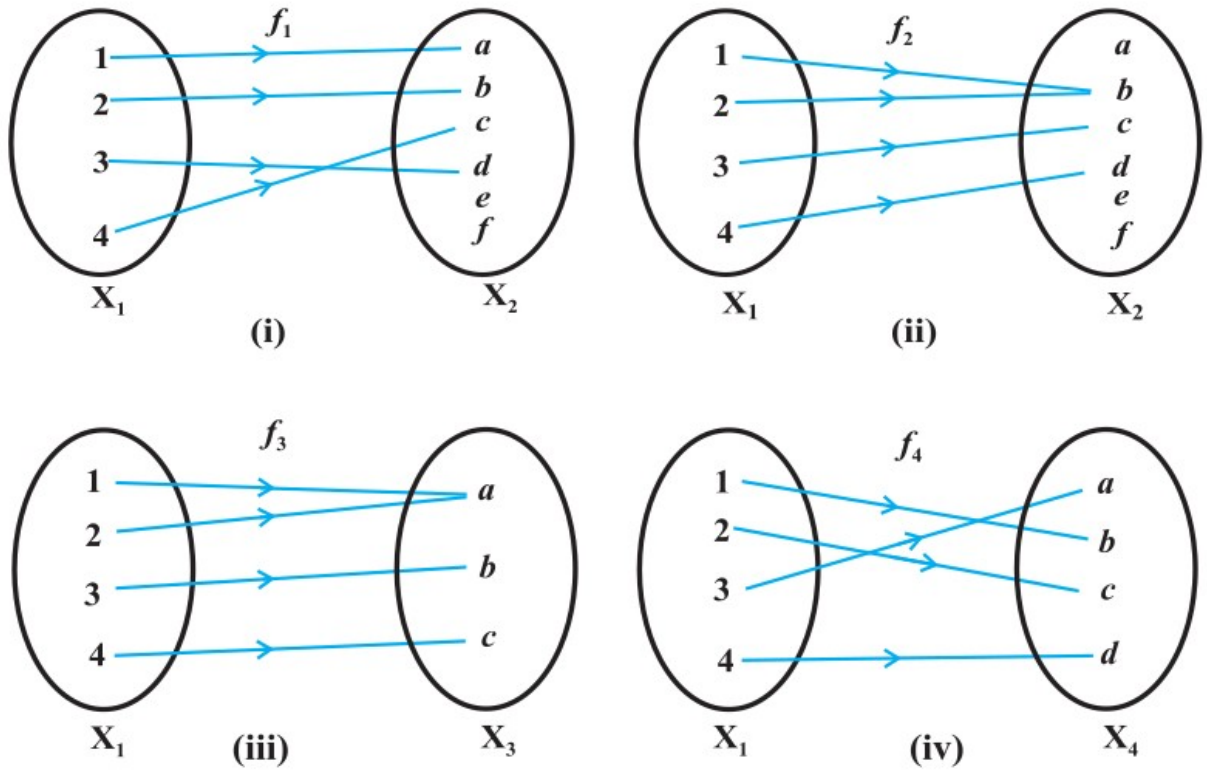
(A) one-one and onto

(B) one-one and not onto

(C) not one-one and onto

(C) not one-one and not onto

3) Which of the following functions is a bijective function. Explain with reasons.



4) Consider the function $f : N \longrightarrow N$ given by $f(x) = 3x + 2,\ x \in N$.

Prove that f is one-one and not onto.

5) Consider the function $f : N \longrightarrow N$ given by $f(x) = x^3,\ x \in N$.

Prove that f injective but not surjective.

6) Consider the function $f : N \longrightarrow N$ given by $f(x) = \begin{cases} x, & if\ x \leq 3 \\ x - 1, & if\ x > 3 \end{cases}$

Prove that f is not a one-one function.

7) Consider the function $f : \left[0, \frac{\pi}{2}\right] \longrightarrow R$ given by $f(x) = sinx$ and

$g : \left[0, \frac{\pi}{2}\right] \longrightarrow R$ given by $g(x) = cosx$.

(i) Show that f and g are one-one functions.

(ii) Is $f + g$ one-one? Why?

8) The number of bijective functions from A={1,2,3,4,5} to B={a,b,c,d,e} is

A) 24 B) 125 C) 25 D) 120

9) Consider the real functions f and g defined by $f(x) = 3 - 2x$ and $g(x) = 2x^2 - 1$.

Which of them is a bijective function? Explain with reasons.

10) Let f:{1,3,4}→{1,2,5} and g:{1,2,5}→{1,3} given by

f={(1,2),(3,5),(4,1)} and g={(1,3),(2,3),(5,1)}. Then find $g \circ f$.

11) Find $f \circ g$ and $g \circ f$ for the following real functions given by

(i) $f(x) = |x|$ and $g(x) = |3x + 4|$ and (ii) $f(x) = 16x^4$ and $g(x) = x^{\frac{1}{4}}$.

12) Consider the real function given by $f(x) = 3x + 2$.

Show that f is invertible and find the inverse of f .

13) Show that f: [-1,1] $\rightarrow R$ given by $f(x) = \frac{x}{x+2}$ is one-one.

Also find the inverse of the function f: [-1,1] → Range f.

14) If $f : R \longrightarrow R$ defined by $f(x) = x^2 - 3x + 2$. Find $(f \circ f)(x)$ and $(f \circ f)(1)$.

15) Let $A = R - \left\{\frac{7}{5}\right\}$ and $B = R - \left\{\frac{3}{5}\right\}$ and functions $f : A \longrightarrow B$ and $g : B \longrightarrow A$

defined by $f(x) = \frac{3x+4}{5x-7}$ and $g(y) = \frac{7y+4}{5y-3}$. Find $g \circ f$.

16) Let f and g are two functions defined on R as $f(x) = 2x - 3$ and $g(x) = \frac{3+x}{2}$.

Prove that f and g are inverse of each other.