



INDIAN SCHOOL AL WADI AL KABIR

Class XII, Mathematics **Worksheet 2- Functions**

11-04-2022

Q.1.	If $f(x) = \begin{cases} 2x, & x > 3 \\ x^2, & 1 \leq x \leq 3 \\ 3x, & x < 1 \end{cases}$, then $f(-1) + f(2) + f(4)$ is							
	A	7	B	9	C	12	D	27
Q.2.	The range of the function $f(x) = \frac{ x-1 }{x-1}, x \neq 1$ is							
	A	{1, -1}	B	R	C	[-1, 1]	D	None of these
Q.3.	Let $f: R \rightarrow R: f(x) = (3 - x^3)^{\frac{1}{3}}$, then $f \circ f(x)$ is							
	A	x	B	x^3	C	$3x^3$	D	$x^{\frac{1}{3}}$
Q.4.	The number of all one-one functions from set $A = \{1,2,3,4\}$ to itself is							
	A	4	B	16	C	24	D	27
Q.5.	If $f: R \rightarrow R$ is defined by $f(x) = 5x + 3$, then f is							
	A	neither one-one nor onto	B	many one onto	C	One to one but not onto.	D	one-one and onto
Q.6.	If $f: R \rightarrow R$ is defined by $f(x) = [x], \forall x \in R$, then f is							
	A	One-one onto	B	Neither one-one nor onto	C	many one onto	D	One-one but not onto
Q.7.	If $f(x)$ be a greatest integer function and $g(x)$ be an absolute value function, then the value of $f \circ g\left(-\frac{3}{2}\right) + g \circ f\left(\frac{4}{3}\right)$ is							
	A	0	B	-2	C	2	D	1
Q.8.	If $f: R \rightarrow R$ is defined by $f(x) = \begin{cases} -1, & \text{if } x \text{ is irrational} \\ 1, & \text{if } x \text{ is rational} \end{cases}$, then $f \circ f(\sqrt{3})$ is							
	A	0	B	-1	C	$\sqrt{2}$	D	1

Q.9.	Let $f : \mathbf{R} - \left\{-\frac{4}{3}\right\} \rightarrow \mathbf{R}$ be a function defined as $f(x) = \frac{4x}{3x+4}$. Then $f^{-1} : \text{Range } f \rightarrow \mathbf{R} - \left\{-\frac{4}{3}\right\}$ given by							
	A	$g(y) = \frac{3y}{3-4y}$	B	$g(y) = \frac{4y}{4-3y}$	C	$g(y) = \frac{4y}{3-4y}$	D	$g(y) = \frac{3y}{4-3y}$
Q.10	Let $f : \mathbf{R} - \{-3\} \rightarrow \mathbf{R} - \{1\}$ be a function defined as $f(x) = \frac{x-2}{x-3}$. Then f is							
	A	injective	B	surjective	C	bijective	D	None of these
Q11.	If $f(x) = 3x + 2$, then write $f \circ f$.							
Q12.	Let $f : \mathbf{N} \rightarrow \mathbf{S}$, where S is range of f, such that $f(x) = 4x^2 + 12x + 15$, then find $f^{-1}(31)$.							
Q13.	Let $f : \mathbf{N} \rightarrow \mathbf{Y} : f(x) = x^2$, where $\mathbf{Y} = \{n^2 : n \in \mathbf{N}\}$, then find $f^{-1}(x)$.							
Q14.	If f and g are two functions from R to R defined as $f(x) = x + x$ and $g(x) = x - x$, then find $f \circ g(x)$ for $x < 0$.							
Q15.	If $f = \{(1,2), (3,5), (4,1)\}$ and $g = \{(1,3), (2,3), (5,1)\}$, then write $f \circ g$.							
Q16.	Show that the function $f: \mathbf{R} \rightarrow \mathbf{R}$ defined by $f(x) = \frac{2x-1}{3}$, $x \in \mathbf{R}$ is one -one and onto function. Also find the inverse of the function f.							
Q17.	If $f(x) = \frac{3x+2}{2x-3}$, $x \neq \frac{3}{2}$, find $f \circ f$.							
Q18.	Consider the function $f: \mathbf{R}_+ \rightarrow [4, \infty[$ defined by $f(x) = x^2 + 4$, where \mathbf{R}_+ is the set of all non negative real numbers. Show that f is invertible. Also find the inverse of f.							
Q19.	$f(x) = 8x^3$, $g(x) = 2x^{\frac{1}{3}}$. Then find $f \circ g$ and $g \circ f$							
Q20.	If $f: \mathbf{R} \rightarrow \mathbf{R}$ and $f(x) = 4 - (x - 7)^3$, find $f^{-1}(x)$.							
Q21.	Let $f: \mathbf{N} \rightarrow \mathbf{N}$ be defined by $f(n) = \begin{cases} \frac{n+1}{2}, & \text{if } n \text{ is odd} \\ \frac{n}{2}, & \text{if } n \text{ is even.} \end{cases}$ Find whether the function is bijective.							
Q22.	Let $f : \mathbf{N} \rightarrow \mathbf{S}$, where S is range of f, such that $f(x) = 4x^2 + 12x + 15$. Show that f is invertible and hence find f^{-1} .							
Q23.	Let $\mathbf{A} = \{-1, 0, 1, 2\}$, $\mathbf{B} = \{-4, -2, 0, 2\}$ and $f, g : \mathbf{A} \rightarrow \mathbf{B}$ be functions defined by $f(x) = x^2 - x$, $x \in \mathbf{A}$ and $g(x) = 2 \left x - \frac{1}{2} \right - 1$, $x \in \mathbf{A}$. Find $f \circ g$ and hence show that $f = g \circ f$							
Q24.	Let the function $f: [0, \infty) \rightarrow \mathbf{R}$ be a function defined by $f(x) = 9x^2 + 6x - 5$. Prove that f is not invertible. Modify, only the codomain of f to make f invertible and then find its inverse.							

Answers	1	B	2	A	3.	A	4	C
	5	D	6	B	7	C	8	D
	9	B	10	C	11	$9x + 8$	12	1
	13	\sqrt{x}	14	$-4x$	15	$\{(1, 3), (3, 1), (4, 3)\}$	16	$\frac{3y + 1}{2}$
	17	x	18	$\sqrt{y - 4}, y \in [4, \infty]$	19	$64x, 4x$	20	$7 + (4 - x)^{\frac{1}{3}}$
	21	No	22	$\frac{\sqrt{y - 6} - 3}{2}$	23	$\{(-1, 2), (0, 0), (1, 0), (2, 2)\}$	24	$\frac{\sqrt{y + 6} - 1}{3}$
