INDIAN SCHOOL AL WADI AL KABIR

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Department of Mathematics, 2020-2021

CLASS: XII | Worksheet- Relations Functions-Part- 2 | 25-03-2020

Q.1.	$If\ f(x) = \begin{cases} 2x, & x > 3 \\ x^2, 1 \le x \le 3 \\ 3x, & x < 1 \end{cases}$, then f(-1) + f(2) + f(4) is							
	A	10	**B**	7	**C**	12	**D**	27
Q.2.	The range of the function f(x) $= \frac{\lvert x-1 \rvert}{x-1}, x \neq 1\ is$							
	A	$\{1, -1\}$	**B**	**R**	**C**	$[-1, 1]$	**D**	None of these
Q.3.	Let $f: R \to R: f(x) = (3 - x^3)^{\frac{1}{3}}, then\ fof\ (x)\ is$							
	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.	$If\ f : R \to R\ is\ defined\ by\ f(x) = 5x + 3, then\ f\ is$							
	A	neither one-one nor onto	**B**	many one onto	**C**	g (y)=$\frac{4y}{3-4y}$	**D**	one-one onto
Q.6.	$If\ f : R \to R\ is\ defined\ by\ f(x) = [x], \forall\ x \epsilon R, then\ f\ is$							
	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 $fog\left(-\frac{3}{2}\right) + gof(\frac{4}{3})$ is							
	A	0	**B**	-2	**C**	2	**D**	1
Q.8.	$If\ f : R \to R\ is\ defined\ by\ f(x) = \begin{cases} -1, if\ x\ is\ irrational \\ 1, if\ x\ is\ rational \end{cases}, then\ fof(\sqrt{2})\ is$							
	A	0	**B**	-1	**C**	$\sqrt{2}$	**D**	1

Q.9.	$Let\ f : \mathbf{R} - \left\{-\frac{4}{3}\right\} \to \mathbf{R}\ be\ a\ function\ defined\ as\ f\ (x) = \frac{4x}{3x+4}$.Then f^{-1} : Range $f \to \mathbf{R} - \left\{-\frac{4}{3}\right\}$ 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.	$Let\ f : \mathbf{R} - \{-3\} \to \mathbf{R} - \{\mathbf{1}\}\ be\ a\ function\ defined\ as\ f\ (x) = \frac{x-2}{x-3}$. Then f is							
	A	injective	**B**	surjective	**C**	bijective	**D**	None of these
Q11.	If f(x) = 3x +2, then fof = …….							
Q12.	Let f : N → S, where S is range of f, such that $f(x) = 4x^2 + 12x + 15$, then $f^{-1}(31)$= ….							
Q13.	Let f : N → Y: $f(x) = x^2$, where $Y = \{n^2 : n\epsilon N\}$, then $f^{-1}(x)$= …………							
Q14.	If f and g are two functions from R to R defined as $f(x) = \|x\| + x$ and $g(x) = \|x\| - x$, then fog(x) for $x < 0$ is … ….							
Q15.	$If\ f = \{(1,2), (3,5), (4,1)\} and\ g = \{(1,3), (2,3), (5,1)\}, then\ gof$=………							
Q16.	Show that the function f: R→R defined by $f(x) = \frac{2x-1}{3}$, $x \in R$ is one –one and onto function. Also find the inverse of the function f.							
Q17.	If $f(x) = \frac{3x+2}{2x-3}, x \neq \frac{3}{2}, find\ fof$.							
Q18.	Consider the function f: $R_+ \to [4, \infty[\ defined\ by\ f(x) = x^2 + 4, where\ R_+\ is$ the set of all non negative real numbers. Show that f is invertible. Also find the inverse of f.							
Q19.	$f(x) = 8x^3, \qquad g(x) = 2x^{\frac{1}{3}}. Then\ find\ fogand\ gof$							
Q20.	$If f : R \to R\ and\ f(x) = 4 - (x-7)^3, find\ f^{-1}$(x).							
Q21.	Let $f: N \to N$ be defined by $f(n) = \begin{cases} \frac{n+1}{2}, if\ n\ is\ odd \\ \frac{n}{2}, if\ n\ is\ even. \end{cases}$ Find whether the function is bijective.							
Q22.	Let f : N → 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 **A** = {−1, 0, 1, 2}, B = {−4, −2, 0, 2} and f, g : A → $B\ be\ functions\ defined\ by\ f(x) = x^2 - x$, x ∈ A $and\ g(x) = 2\left\|x - \frac{1}{2}\right\|$ **− 1,** x ∈ $A.\ Find\ gof\ and\ hence\ show\ that\ f = g = gof$							
Q24.	Let the function f: $[0, \infty) \to R\ be\ a\ function\ defined\ by\ f(x) = 9x^2 + 6x - 5$. 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**	$\sqrt{y-4}, y \epsilon [4,\infty]$	**19**	64x, 4x	**20**	$7 + (4-x)^{\frac{1}{3}}$
	21	No	**22**	$\frac{\sqrt{y-6}-3}{2}$	**23**	$\left\{ \begin{matrix} (-1,2),(0,0), \\ (1,0),(2,2) \end{matrix} \right\}$	**24**	$\frac{\sqrt{y+6}-1}{3}$

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