INDIAN SCHOOL AL WADI AL KABIR

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

12-05-2024

Q.1.	$If\ n(A) = 5\ then\ the\ number\ of\ one\ to\ one\ functions\ from\ A\ to\ A$:							
	A	25	**B**	10	**C**	2^{25}	**D**	120
Q.2.	The range of the function f(x) $= \frac{\|x-2\|}{x-2}, x \neq 2\ is$							
	A	$\{1, -1\}$	**B**	**R**	**C**	$[-1, 1]$	**D**	None of these
Q.3.	Let $f: N \to R: f(x) = x^3, then\ f\ is$							
	A	bijective	**B**	one to one but not onto	*C*	not one to one but onto	**D**	None of these
Q.4.	The number of reflexive relations from set A = {1,2,3} to itself is							
	A	9	**B**	512	**C**	64	**D**	27
Q.5.	$If\ f: R \to R\ is\ defined\ by\ f(x) = \frac{5x+3}{4}, then\ f\ is$							
	A	neither one-one nor onto	**B**	many one onto	**C**	one to one but not onto	**D**	one-one and onto
Q.6.	$If\ f: R^+ \to R\ is\ defined\ by\ f(x) = \|x\|, \forall\ x\ \epsilon\ R, then\ f\ is$							
	A	One-one onto	**B**	Neither one-one nor onto	**C**	*many one onto*	**D**	One-one but not onto
Q.7.	The number of functions from set A = {1,2,3} to B = {5, 6, 7} =_____ .							
	A	512	**B**	9	**C**	27	**D**	2^9
Q.8.	$Let\ f: R - \left\{-\frac{4}{3}\right\} \to R - \left\{-\frac{4}{3}\right\}\ be\ a\ function\ defined\ as\ f\ (x) = y = \frac{4x}{3x+4}$, then x =							
	A	$\frac{3y}{3-4y}$	**B**	$\frac{4y}{4-3y}$	**C**	$\frac{4y}{3-4y}$	**D**	$\frac{3y}{4-3y}$

	In the following questions (9 and 10), a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices. A) Both A and R are true and R is the correct explanation of A. B) Both A and R are true but R is not the correct explanation of A. C) A is true but R is false. D) A is false but R is true.
Q9	(A) If f(x) = $\frac{1}{x}, f: R-\{0\} to R-\{0\} then\ f\ is\ a\ bijective\ function$
	(R) A function is bijective if and only if f is one to one and onto.
Q10.	$(A)\ If\ f(x)=x^2, f: N\ to\ N, then\ f\ is\ onto.$
	(R) A function is onto if codomain = range of the function
Q11.	$Let\ f: N \to S, where\ S\ is\ range\ of\ f, such\ that\ f(x)=9x^2+6x-1, then\ find\ x\ if\ \ f(x)=14.$
Q12.	Show that the function f: R→R defined by f(x) $=cosx$ x∈ R is neither one to one nor onto function.
Q13.	If f(x) $=\frac{3x+2}{2x-3}, x \neq \frac{3}{2},\ Prove\ f\ is\ one\ to\ one.$
Q14.	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.
Q15.	$f(x)=\frac{x}{1+x^2}\ f: R\ to\ \left[-\frac{1}{2}, \frac{1}{2}\right]$. Check whether f is one to one and onto.
Q16.	Let $f: N \to N$ be defined by $f(n)=\begin{cases}\frac{n+1}{2}, if\ n\ is\ odd\\ \frac{n}{2}, if\ n\ is\ even\end{cases}$. Show that the function is not bijective.
Q17.	$Let\ f: [0, \infty) \to [-1, \infty)\ \ such\ that\ f(x)=x^2+2x$. Show that f is invertible.
Q18.	Let the function f: $[0, \infty) \to R\ be\ a\ function\ defined\ by\ f(x)=4x^2+4x-5$. Prove that f is one to one but not onto. Modify, only the codomain of f to make f onto.
Q19	Case study questions: Students of Grade 12, planned to plant saplings along straight lines, parallel to each other to one side of the playground ensuring that they had enough play area. Let us assume that they planted one of the rows of the saplings along the line $y=x+4$. Let L be the set of all lines which are parallel on the ground and R be a relation on L. Based on the above information, answer the following: a) Let R be a relation such that R= $\{(L_1, L_2): L_1 \parallel L_2, L_1, L_2 \in L\}$. $Is\ R$ an equivalence relation? Why? b) If $f(x)=\ x+4, f: N\ to\ N, then\ check\ f\ is\ one\ to\ one\ or\ onto.$ c) Write the range of the following functions: i) f(x) $=x^2+2, x \in R$ ii) $f(x)=\sqrt{9-x^2}, x \in [-3, 3]$

ANSWER

1	D	**2**	A	**3.**	B	**4**	C
5	D	**6**	D	**7**	C	**8**	B
9	A	**10**	D	**11**	1	**12**	Onto but not one to one
19	a) Yes b) One to one only. c) i) $[2, \infty)$ ii) $[0, 3]$						

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