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Dept. of Mathematics 2025 – 2026
Class XI – Mathematics
Work Sheet – Relations and Functions

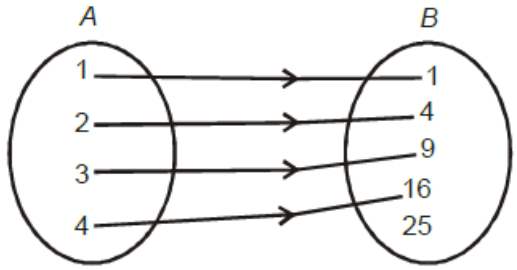
1	If A = {1, 2, 4}, B = {2, 4, 5}, C = {2, 5} then (A – B) × (B – C) (a) {(1, 2), (1, 5), (2, 5)} (b) {1, 4} (c) {1, 4} (d) None of these.
2	If R is a relation on set A = {1, 2, 3, 4, 5, 6, 7, 8} given by xRy ⇔ y = 3x, then R = ? (a) {(3, 1), (6, 2), (8, 2), (9, 3)} (b) {(3, 1), (6, 2), (9, 3)} (c) {(3, 1), (2, 6), (3, 9)} (d) None of these.
3	Let A = {1, 2, 3}, B = {4, 6, 9} if relation R from A to B defined by x is greater then y. the range of R is (a) {1, 4, 6, 9} (b) {4, 6, 9} (c) {1} (d) None of these.
4	If R be a relation from a set A to a set B then - (a) $R = A \cup B$ (b) $R = A \cap B$ (c) $R \subseteq A \times B$ (d) $R \subseteq B \times A$.
5	If $2f(x) - 3f\left(\frac{1}{x}\right) = x^2$ $(x \neq 0)$, then f(2) is equal to - (a) $\frac{-7}{4}$ (b) $\frac{5}{2}$ (c) -1 (d) None of these.
6	Doman of $f(x) = \sqrt{4x - x^2}$ is - (a) R – [0, 4] (b) R – (0, 4) (c) (0, 4) (d) [0, 4].
7	If $[x]^2 - 5[x] + 6 = 0$, where [.] denote the greater integer function then (a) $x \in [3, 4]$ (b) $x \in (2, 3]$ (c) $x \in [2, 3]$ (d) $x \in [2, 4)$.
8	Find a and b if (a – 1, b + 5) = (2, 3)

9	If P = {1,3}, Q = {2,3,5}, find the number of relations from P to Q
10	If R = {(x,y): x,y $\in$ Z, $x^2 + y^2 = 64$}, then, Write R in roster form
11	Which of the following relations are functions? Give reason. R = { (1,1), (2,2), (3,3), (4,4), (4,5)} R = { (2,1), (2,2), (2,3), (2,4)} R = { (1,2), (2,5), (3,8), (4,10), (5,12), (6,12)}
12	If A and B are finite sets such that n(A) = 5 and n(B) = 7, then find the number of functions from A to B.
13	If $f(x) = x^3$, find the value of, $\frac{f(5)-f(1)}{5-1}$
14	Find the domain of the real function, $f(x)=\sqrt{x^2-4}$
15	Find the domain of the function, $f(x)=\frac{x^2+2x+3}{x^2-5x+6}$
16	Find the range of the following functions. $f(x)=\frac{1}{4-x^2}$ $f(x) = x^2 + 2$
17	Find the domain of the relation, R = {(x, y): x, y $\in$ Z, xy = 4}
18	**Find the range of the following relations** R = {(a,b) : a, b $\in$ N and 2a + b = 10} $R=\left\{\left(x,\frac{1}{x}\right): x\in z, 0<x<6\right\}$
19	Let A = {1,2,3,4}, B = {1,4,9,16,25} and R be a relation defined from A to B as, R = {(x, y): x $\in$ A, y $\in$B and $y = x^2$} (a) Depict this relation using arrow diagram. (b) Find domain of R. (c) Find range of R. (d) Write co-domain of R.

20	If A = {2,4,6,9} B = {4,6,18,27,54} and a relation R from A to B is defined by R = {(a,b): a∈ A, b∈ B, a is a factor of b and a < b}, then find in Roster form. Also find its domain and range.
	Find the domain and range of the following real functions
21	$f(x) = \|2x - 3\| - 3$
22	$f(x) = \sqrt{x^2 + 4}$
23	$f(x) = \frac{x+1}{x-2}$
24	$f(x) = \frac{\|x+1\|}{x+1}$
25	$f(x) = \frac{x^2 - 9}{x-3}$
26	$f(x) = \frac{4-x}{x-4}$
27	$f(x) = 1 - \|x-3\|$
	Find the domain of the following function.
28	$f(x) = \frac{1}{\sqrt{x+\|x\|}}$
29	$f(x) = \frac{1}{\sqrt{9-x^2}}$
30	If $f(x) = x - \frac{1}{x}$ prove that $[f(x)]^3 = f(x^3) + 3f\left(\frac{1}{x}\right)$

Answers

1	B	2	D	3	C	4	C
5	A	6	D	7	D	8	a = 3, b = -2

9	$2^6 = 64$						
10	R = { (0,8), (0,-8), (8,0), (-8,0)}						
11	(i) Not a function because 4 has two images. (ii) Not a function because 2 does not have a unique image (iii) Function because every element in the domain has its unique image.						
12	7^5	13	31	14	$(-\infty, -2] \cup [2, \infty)$	15	R - {2,3}
16	$(-\infty, 0] \cup [\frac{1}{4}, \infty)$ $[2, \infty)$						
17	{-4, -2, -1,1, 2, 4}						
18	{2, 4, 6, 8} $\left\{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}\right\}$						
19	(a)  (b) {1, 2, 3, 4} (c) {1, 4, 9, 16} (d) {1, 4, 9,16, 25}						
20	R = { (2,4) (2,6) (2,18) (2,54) (6,18) (6,54) (9,18) (9,27) (9,54) } Domain is R = {2,6,9} Range of R = { 4, 6, 18, 27, 54}						
21	Domain is R Range is $[-3, \infty)$	22	Domain = R, Range = $[2, \infty)$				
23	Domain = R – {2} Range = R – {1}	24	Domain = R – {–1} Range = {1, –1}				
25	Domain = R – {3} Range = R – {6}	26	Domain = R – {4} Range = {–1}				
27	Domain = R Range =$(-\infty, 1]$						
28	$(0, \infty)$						
29	(-3, 3)						