



Class: XI

Sub: MATHEMATICS (041)

Date: 10.05.2026

Section – A

- 1 The number of non-empty subsets of a set, containing n elements, is
(a) n (b) n^2 (c) 2^n (d) $2^n - 1$
- 2 Which of the following statement is false?
(a) $A - B = A \cap B'$ (b) $A - B = A - (A \cap B)$
(c) $A - B = A - B'$ (d) $A - B = (A \cup B) - B$
- 3 Let R be a relation on N defined by $R = \{(x, y): x + 2y = 8, x, y \in N\}$. Then domain of R is
(a) $\{2, 4, 8\}$ (b) $\{2, 4, 6, 8\}$ (c) $\{2, 4, 6\}$ (d) $\{1, 2, 3, 4\}$
- 4 If $f(x) = x^3 - \frac{1}{x^3}$, then $f(x) + f\left(\frac{1}{x}\right)$ is equal to
(a) $2x^3$ (b) $\frac{2}{x^3}$ (c) 0 (d) 1
- 5 If $(x + 3, 5) = (6, 2x + y)$ then x, y is equals to
(a) $3, -1$ (b) $3, 0$ (c) $0, -1$ (d) None of these
- 6 Which of the following is not correct?
(a) $\sin \theta = -\frac{1}{5}$ (b) $\cos \theta = 1$ (c) $\sec \theta = \frac{1}{2}$ (d) $\tan \theta = 20$
7. The length of minor arc of a circle of diameter 42cm corresponding to a chord length 21cm is:
(a) 22cm (b) 42 cm (c) 11 cm (d) 84 cm
8. If $f(x) = ax + b$, where a and b are integers, such that $f(-1) = -5$ and $f(3) = 3$, then a and b are equal to:
(a) $-3, -1$ (b) $2, -3$ (c) $0, 2$ (d) $2, 3$
9. If a function $f(x) = \left\{ \left(x, \frac{x^2}{1+x^2} \right) : x \in R \right\}$ is defined from R to R , then its range is
(a) R (b) $(-\infty, \infty)$ (c) $[0, 1)$ (d) $[0, \infty)$
10. If $n(A) = 3$ and $n(B) = 2$, then number of relations from A to B :
(a) 6 (b) 5 (c) 36 (d) 64

Assertion and Reasoning: (Q11 to 12)

- (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 and R is True

11. **Assertion (A):** $\sin(-270)^\circ = 1$.
Reason (R): $\sin(180^\circ + \theta) = \sin \theta$
12. **Assertion (A):** $R = \{(1, 2), (2, 3), (2, 2), (3, 3), (4, 4)\}$ is a function.
Reason (R): A function is a relation.

Section – B

13. If $\sin x = -\frac{5}{13}$, x lies in III quadrant, find the values of $\tan x$, $\cos x$.
14. Let $A = \{1, 2, 3, 4, 5, 6\}$. Let R be a relation on A defined by $R = \{(a, b) : b \text{ is exactly divisible by } a; a, b \in A\}$, then
 (i) Write R in roster form. (ii) Find the domain of R . (iii) Find the range of R .
15. If $A = \{x : x \in R, x \text{ is the root of the equation } x^3 - x = 0\}$, and
 $B = \{x : x \in R, x \text{ is the root of } x^3 + 2x^2 - x - 2 = 0\}$
 Then find the values of (i) $A \cup B$ (ii) $A \cap B$
16. Two finite sets A and B have 'm' and 'n' elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. Find the values of 'm' and 'n'.
17. Convert 1.1 radian to degree measure. ($\pi = \frac{22}{7}$)
18. The minute hand of a watch is 1.5 cm long. How far does its tip move in 40 minutes?
 (Use $\pi = 3.14$)
19. Given $A = \{1, 2, 3, \dots, 20\}$. Write $R = \{(x, y) : y = 3x + 1, x, y \in A\}$ in roster form

Section – C

20. Draw appropriate Venn diagrams for each of the following:
 (i) $A \cup B$ (ii) $A \cap B$ (iii) $(A - B) \cup (B - A)$
21. If $A = \{1, 2, 3, 4\}$, $B = \{3, 4, 5, 6\}$, $C = \{5, 6, 7, 8\}$ and $D = \{7, 8, 9, 10\}$ then find
 (i) $B \cup C$ (ii) $A \cup B \cup D$ (iii) $B \cup (C \cap D)$ (iv) $A - (B \cup C)$
22. The function "t" maps the temperature in degree Celsius into temperature in degree Fahrenheit is defined by $t(C) = \frac{9C}{5} + 32$ find (i) $t(28)$ (ii) the value of C when $t(C) = 212$.
23. Write domain and range : a) $x^2 + 1$ b) $\sqrt{25 - x}$ c) $|x - 1| + 2$

Section – D

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Ram and Ravi decide to play a game on sets. Ram says “I LOVE MATHEMATICS” and Ravi says “I LOVE STATISTICS”. If they form the letters of their statements in the set and named Ram’s saying as set A and Ravi’s saying as set B.

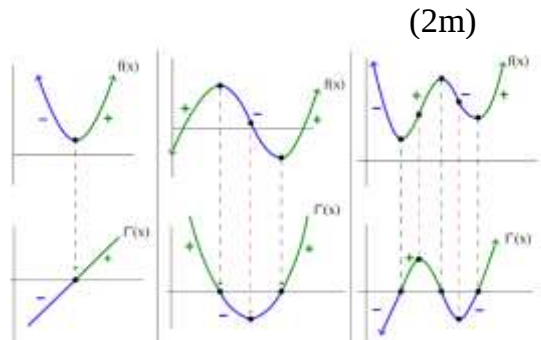


Based on the above answer the following questions

- (i) Write roster form of A and B. (1m)
 - (ii) Check whether the following statements are True or False with reason:
 - a) $A=B$ b) $B \subset A$ (1m)
 - (iii) a) Check whether : $(A - B) \cup (B - A) = (A \cup B) - (A \cap B)$ (2m)
- OR -

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Verify: $n(A \cup B) = n(A) + n(B) - n(A \cap B)$.
Nikita was explaining "method to find domain codomain and range of relations and functions" to her daughter. There are four functions given below:

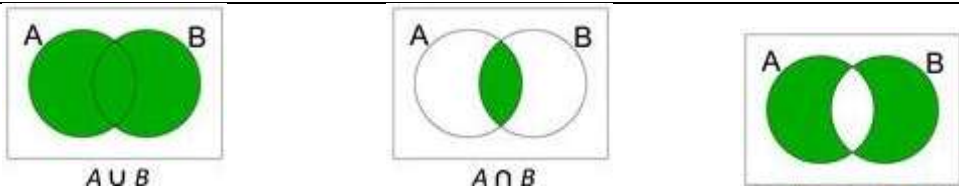


- a) $g(x) = [x]$, greatest integer function.
- b) $p(x) = \frac{x^2}{1+x^2}$
- c) $h(x) = \sqrt{9 - x^2}$
- d) $u(x) = \begin{cases} \frac{|x|}{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$

Based on the above answer the following:

- (i) What is the range of $u(x)$?
- (ii) Evaluate: $h(3) + h(1)$
- (iii) a) Evaluate: $g(3.2) + g(-3.5)$. Or b) Write domain and range of $h(x)$.

Answer Key

1.	(d) $2^n - 1$
2.	(c) $A - B = A - B'$
3.	(c) $\{2, 4, 6\}$
4.	(c) 0
5.	(a) 3,-1
6.	(c) $\sec \theta = \frac{1}{2}$
7.	(a)
8.	(b)
9.	(c)
10.	(d)
11.	(C) A is true but R is false
12.	(D) A is false R is true
13.	$\cos x = -\frac{12}{13}, \tan x = \frac{5}{12}$
14.	(i) $R = \{(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 2), (2, 4), (2, 6), (3, 3), (3, 6), (4, 4), (5, 5), (6, 6)\}$ (ii) Domain = $\{1, 2, 3, 4, 5, 6\}$ (iii) Range = $\{1, 2, 3, 4, 5, 6\}$
15.	$A = \{0, -1, 1\}$ and $B = \{-2, -1, 1\}$ $A \cup B = \{0, -1, 1, -2\}$ $A \cap B = \{-1, 1\}$
16.	m=6 and n=3
17.	63^0
18.	6.28 cm
19.	$R = \{(1,4), (2,7), (3,10), (4,13), (5,16), (6,19)\}$
20.	
21.	(i) $\{3,4,5,6,7,8\}$ (ii) $\{1,2,3,4,5,6,7,8,9,10\}$ (iii) $\{3,4,5,6,7,8\}$ (iv) $\{1,2\}$
22.	i) 82.4 ii) 100
23.	i) R to $[0, \infty)$ ii) $(-\infty, 25]$ to $[1, \infty)$ (iii) R to $[2, \infty)$
24.	i) $A = \{I, L, O, V, E, M, A, T, H, C, S\}$, $B = \{I, L, O, V, E, S, T, A, C\}$ ii) a) False, b) True iii) a) $(A - B) \cup (B - A) = \{M, H, S\} = (A \cup B) - (A \cap B)$
25.	i) $\{-1, 0, 1\}$ ii) $2\sqrt{2}$ iii) a) $3 + -4 = -1$, b) $[-3, 3]$ to $[0, 3]$
