

MTH202

Mid-Term

Quiz by Attiq Kundi

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MTH-202

Range of function / $[f(x) = (e^x)/]$ is _____

- Set of positive real numbers

Composite relation symbolically written as _____

- $SoR = \{(a,c) \in A, c \in C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$

If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x?

- 12

Range of the relation $\{(0, 1), (3, 22), (90, 34)\}$

- $\{1, 22, 34\}$

Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A. the which of the following ordered pairs are needed to make it transitive?

- $(0, 0)$ and $(2, 2)$

Operation of subtraction is a binary operation on the set of _____

- Integers

Let $S=R$ and define the 'square' relation $R= \{(x, y) | x^2=y^2\}$. The square relation is a _____ relation

- Equivalence relation

The logic gate NOT is a unitary operation on $\{0, 1\}$.

- True

Let $A= \{1, 2\}$, then $P(A)=$ _____

- $\{\{\}, \{1\}, \{2\}, \{1, 2\}\}$

If a relation R is reflexive, anti-symmetric and transitive then which of the following is not true for the inverse relation.

- Inverse relation will be ir-reflexive.

Let R be a binary relation on a set A , R is anti-symmetric if _____

- $a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a=b$

"-" is a binary operation on the set of integers Z .

- True

The inverse relation R^{-1} from B to A is defined as _____

- $R^{-1} = \{(b,a) \in B \times A \mid (a,b) \in R\}$

Which of the following is always true for the matrix representation of a symmetric relation?

- Matrix is equal to its transpose

Let $A = \{1,2,3,4\}$ and let R and S be transitive binary relations on A defined as; $R = \{(1,2), (1,3), (2,2), (3,3), (4,2), (4,3)\}$ and $S = \{(2,1), (2,4), (3,3)\}$ then $R \cup S = \{(1,2), (1,3), (2,1), (2,2), (2,4), (3,3), (4,2), (4,3)\}$

- R union S is transitive

Let $S=R$ and define the 'square' relation $R = \{(x, y) \mid x^2 = y^2\}$. The square is a _____ relation.

- Equivalence relation

If $x \equiv -10 \pmod{15}$. Which of the following integers are valid solution for x?

- 5

Let R be a binary relation on a set A. If R is anti-symmetric then _____

- Inverse of R is anti-symmetric

If $A = \{1, 2, 3\}$ is a set and $R = \{(1,2), (2,2), (2,1)\}$ is a relation on A, R is

- Symmetric

Let $A = \{0, 1\}$ and $B = \{1\}$. Let R and S be two binary relations on Cartesian product of A and B such that $R = \{(0, 1)\}$ and $S = \{(1, 1)\}$. Then $R \cap S =$ _____

- Empty

A relation R is said to be _____ if it is reflexive, antisymmetric and transitive.

- Partial order Relation

Let $X = \{1, 2, 3\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

- Co-domain of f must contain 1 element

The function $f \circ g$ and $g \circ f$ are always equal

- False

If a relation $R = \{(1, 2), (2, 3), (3, 4), (4, 1), (2, 2)\}$ is given then which of the following is true about this relation.

- R is reflexive

A set is called countable if , and only if, it is _____

- finite

Let $f(x) = x^2 - 1$ define function f from $\mathbb{R}$ to $\mathbb{R}$ and $c=2$ be any scalar, then $c \cdot f(x)$ is _____

- $2x^2 + 2$

The set $\mathbb{Z}$ of all integers is _____

- Countable

Let R be a binary relation on a set A . If R is anti symmetric then _____

- Inverse of R is symmetric

For $(2x-3, 4y+2) = (1, 10)$. What will be the value of x and y ?

- $(2, 2)$

Let f and g be the two functions from $\mathbb{R}$ to $\mathbb{R}$ defined by $f(x) = |x|$ and $g(x) = \text{square root of } x^2$ for all $x \in \mathbb{R}$. Then _____

- $f(x)$ is not equal to $g(x)$

If a set A has 15 elements then $P(A)$ (power set of A) has _____ elements.

- 2^{15}

For the relation below to be a function, x cannot be what values $\{(12, 14), (13, 5), (-2, 7), (x, 13)\}$?

- x cannot be 12, 13, or -2

Let the set $A = \{1,2,3,4\}$. Then the relation $\{(2,4),(4,2)\}$ is

- Symmetric

For the following relation to be a function, x can not be what values? $R = \{(2,4), (x,1), (4,2), (5,6)\}$.

- x cannot be 2, 4 and 5

Vertical line test is used to determine that whether the graph of a relation is a function or not.

- True

The properties of being symmetric and being anti symmetric are

- Not negative of each other

The number of elements in $A \times B$ are _____ if A is a set with '5' elements and B is a set with '4' elements.

- 20

$R = \{(a,1)(b,2)(c,3)(d,4)\}$ then the inverse of this relation is

- $\{(1,a)(2,b)(3,c)(4,d)\}$

Logic gate NOT does not define a binary operation on $(0,1)$ because

- It takes a single input and gives a single output

How many real numbers exist between 1 and 5

- 3

The number pi is

- Irrational

The number square root 2 is

- Irrational

Range the relation $\{(0, 1) (3,22),(90,34)\}$

- $\{0,3,90\}$

Spherical coordinate 0 is related to the cylindrical coordinate as _____

- $@=@$

Operation of subtraction is a binary operation on the set _____

- Integers

Let $A = \{1,2,3,4\}$ and $R = \{(1,2),(2,3),(3,3),(3,4)\}$ be a relation on A. Then which one of the following ordered pair has made R not an irreflexive relation?

- $(3,3)$

Input values of the function are called the _____

- Domain

Range of function $f(x) = I \times I$ will be

- Set of positive real numbers

Which of the following is not a binary operation on the set of integers?

- Division

In the matrix representation of an ir-reflexive relation all the entries in the main diagonal are _____

- 0

If the partition set of A is $\{A_1, A_2\}$ then

- $A_1 \cap A_2 = \text{not empty set}$

Let $A = \{a, b\}$ then $P(A) =$

- $\{\text{Non empty set}, \{a\}, \{b\}, \{a, b\}\}$

Which relations below are not functions?

- $\{(13, 14), (13, 5), (16, 7), (18, 13)\}$

In the directed graph of an antisymmetric relation there is _____ pair of arrows between two distinct elements of the set.

- No

If a relation $R = (1,1), (2,1), (2,2)$ is given then which of the following is not true about this relation

- R is ir-reflexive

Let R and S be transitive relations on a set A then _____

- Neither $R \cup S$ is transitive nor $R \cap S$ is transitive

Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Domain of the inverse of the relation is _____

- $\{2,4,6,8\}$

Let $A = \{1,2,3,4,5\}$ and $B = \{4,9,16,17,25\}$. Then the relation $R = \{(2,4), (3,9), (4,16), (9,17)\}$ The inverse of R is'

- $\{(4,2), (9,3), (16,4), (17,9)\}$

Let R be a relation on a set A . If R is symmetric then its complement is _____

- Ir-reflexive

Which is not a binary operation on the set of natural numbers N ?

- Subtraction

If a relation $R = \{(1,1), (2,1), (1,2), (2,2)\}$ is given then which of the following is not true about this relation.

- R is irreflexive

$R = \{(a,1), (b,2), (c,3), (d,4)\}$ then the inverse of this relation is _____

- $\{(1,a), (2,b), (3,c), (4,d)\}$

For any set A, the Cartesian product of A and A is known as

- Universal relation

Let $A = \{p, q, r, s\}$ and define a relation R on A by $R = \{(p, p), (p, r), (q, r), (q, s), (r, s)\}$ Then which one of the following is the correct statement about R:

- R is not reflexive

$A = \{1, 2\}$ $B = \{3, 4\}$, $R = \{(1, 3)(2, 4)\}$. Then the complement of R is

- $\{(1, 4)(2, 3)\}$

Domain of a relation symbolically written as_____.

- $\text{Dom}(R) = \{a \in A \mid (a, b) \in R\}$

Let $X = \{2, 4, 5\}$ and $Y = \{1, 2, 4\}$ and R be a relation from X to Y defined by $R = \{(2, 4)(4, 1)(a, 2)\}$. For what value of 'a' the relation R is a function?

- 5

Let $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, then which of the following sets represent the partition of the set A?

- $A = \{1, 3, 5, 7, 9\}$, $B = \{2, 4, 6\}$, $C = \{8\}$

Let $A = \{1, 2, 3\}$ and $B = \{2, 4\}$ then number of binary relations from A to B are _____.

- 64

A relation R is said to be _____ iff it is reflexive, antisymmetric and transitive.

- Partial order Relation

Let f be a function from $X = \{2, 4, 5\}$ to $Y = \{1, 2, 4, 6\}$ defined as: $f = \{(2, 6), (4, 2), (5, 1)\}$. The range of f is _____

- $\{1, 2, 6\}$

Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A . Then which of the following statement about R is true?

- R is symmetric

Let $A = \{2, 3, 4\}$ and $B = \{2, 6, 8\}$ and let R be the "divides" relation from A to B i.e for all (a, b) belong to (Cartesian product of A and B), $a, R b$ iff a divides b . Then

- $R = \{(2, 2), (2, 6), (2, 8), (3, 6), (4, 8)\}$

Let $A = \{1, 2, 3, \dots, 50\}$ and $B = \{2, 4, 6, 8, 10\}$. Then the Cartesian product of A and B has _____ elements.

- 250

In the matrix representation of an reflexive relation all the entries in the main diagonal are _____

- 1

Which of the following is not a type of a relation?

- **Permutation**

Let $X=\{2,4,5\}$ and $Y=\{1,2,4\}$ and R be a relation from X to Y defined by $R=\{(2,4),(4,1),(a,2)\}$. For what value of 'a' the relation R is a function ?

- **5**

Which of the following is not a representation of a relation?

- **Venn diagram**

Let $A=\{1,2,3,4\}$ and define the following relations on A . Then $R=\{(1,3),(1,4),(2,3),(2,4),(3,1),(3,4)\}$ is _____

- **R is irreflexive**

The range of $f:X \rightarrow Y$ is also called the image of

- **True**

Complementary Relation symbolically written as _____

- **$R=A \times B - R = \{(a,b) \in A \times B \mid (a,b) \text{ not belong to } R\}$**

Let $A=\{1,2,3,4\}$ and $R=\{(1,1),(2,2),(3,3),(4,4)\}$ then R is

- **All options**

Which of the following is not a binary operation on the set of integers?

Division

In the matrix representation of an irreflexive relation all the entries in the main diagonal are _____

0

If the partition set of A is $\{A_1, A_2\}$ then

$A_1 \cap A_2 = \text{not empty set}$

Let $A = \{a, b\}$ then $P(A) =$

{Non empty set, $\{a\}, \{b\}, \{a, b\}$ }

Which relations below are not functions?

$\{(13, 14), (13, 5), (16, 7), (18, 13)\}$

In the directed graph of an antisymmetric relation there is _____ pair of arrows between two distinct elements of the set.

No

Let $A = \{0, 1, 2\}$ and $R = \{(0, 2), (1, 1), (2, 0)\}$ be a relation on A. The which of the following ordered pairs are needed to make it transitive?

$(0, 0)$ and $(2, 2)$

Operation of subtraction is a binary operation on the set of _____

Integers

Let $S = \mathbb{R}$ and define the 'square' relation $R = \{(x, y) \mid x^2 = y^2\}$. The square relation is an _____ relation

Equivalence relation

The logic gate NOT is a unary operation on $\{0, 1\}$.

True

Let $A = \{1, 2\}$, then $P(A) = \{\emptyset, \{1\}, \{2\}, \{1, 2\}\}$ AL-JUNAID INSTITUTE GROUP

$\{\emptyset, \{1\}, \{2\}, \{1, 2\}\}$

If a relation R is reflexive, anti symmetric and transitive then which of the following is not true for the inverse relation.

Inverse relation will be irreflexive.

Let R be a binary relation on a set A , R is anti-symmetric iff _____

$a, b \in A$ if $(a, b) \in R$ and $(b, a) \in R$ then $a = b$

"-" is a binary operation on the set of integers $\mathbb{Z}$.

True

The inverse relation R^{-1} from B to A is defined as _____

$R^{-1} = \{(b, a) \in B \times A \mid (a, b) \in R\}$

Which of the following is always true for the matrix representation of a symmetric relation?

Matrix is equal to its transpose

Let $A = \{1, 2, 3, 4\}$ and let R and S be transitive binary relations on A

defined as; $R = \{(1, 2), (1, 3), (2, 2), (3, 3), (4, 2), (4, 3)\}$ and $S = \{(2, 1), (2, 4), (3, 3)\}$ then $R \cup S = \{(1, 2), (1, 3), (2, 1), (2, 2), (2, 4), (3, 3), (4, 2), (4, 3)\}$

R union S is transitive

Let $S = R$ and define the 'square' relation $R = \{(x, y) \mid x^2 = y^2\}$. The square is an _____ relation.

Equivalence relation

If $x \equiv -10 \pmod{15}$. Which of the following integers are valid solution for x ?

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Let R be a binary relation on a set A . If R is anti symmetric then

Inverse of R is anti symmetric

If $A = \{1, 2, 3\}$ is a set and $R = \{(1, 2), (2, 2), (2, 1)\}$ is a relation on A , R is

Symmetric

Let $A=\{0,1\}$ and $B=\{1\}$. Let R and S be two binary relations on Cartesian product of A and B such that $R=\{(0,1)\}$ and $S=\{(1,1)\}$. Then $R \cap S =$ _____

Empty

A relation R is said to be _____ iff it is reflexive, antisymmetric and transitive.

Partial order Relation

Let $X=\{1,2,3\}$ and $Y=\{7,8,9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 1 element

The function $f \circ g$ and $g \circ f$ are always equal

False

If a relation $R=\{(1,2),(2,3),(3,4),(4,1),(2,2)\}$ is given then which of the

following is true about this relation.

R is reflexive

A set is called countable if , and only if, it is _____

Finite

Range of function $f(x)=e^x$ is _____

Set of positive real numbers

Composite relation symbolically written as _____

$S \circ R = \{(a,c) \in A \times C, \exists b \in B, (a,b) \in R \text{ and } (b,c) \in S\}$

If $x \equiv 17 \pmod{5}$ which of the following integers are valid solution for x ?

12

Range of the relation $\{(0,1), (3,22), (90,34)\}$

$\{1,22,34\}$

Let $f(x) = x^2 - 1$ define function f from $\mathbb{R}$ to $\mathbb{R}$ and $c=2$ be any scalar, then $c, f(x)$ is _____
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GROUP

$2x^2 + 2$

The set $\mathbb{Z}$ of all integers is _____

Countable

Let R be a binary relation on a set A. If R is anti symmetric then _____

Inverse of R is symmetric

For $(2x-3, 4y+2) = (1,10)$. What will be the value of x and y ?

$(2,2)$

Let f and g be the two functions from $\mathbb{R}$ to $\mathbb{R}$ defined by $f(x) = |x|$ and $g(x) = \text{square root of } x^2$ for all $x \in \mathbb{R}$. Then _____

$f(x)$ is not equal to $g(x)$

If a set A has 15 elements then $P(A)$ (power set of A) has _____ elements.

2^{15}

For the relation below to be a function, x cannot be what values $\{(12,14),(13,5),(-2,7),(x,13)\}$?

x cannot be 12, 13, or -2

Let the set $A = \{1,2,3,4\}$. Then the relation $\{(2,4),(4,2)\}$ is _____

Symmetric

For the following relation to be a function, x can not be what values? $R=\{(2,4),(x,1), (4,2),(5,6)\}$.

x cannot be 2,4 and 5

Vertical line test is used to determine that whether the graph of a relation is a function or not.

True

The properties of being symmetric and being anti symmetric are _____

Not negative of each other

The number of elements in $A \times B$ are _____ if A is a set with '5' elements and B is a set with '4' elements.

20

$R=\{(a,1)(b,2)(c,3)(d,4)\}$ then the inverse of this relation is _____

$\{(1,a)(2,b)(3,c)(4,d)\}$

Logic gate NOT does not define a binary operation on $(0,1)$ because _____

It takes a single input and gives a single output

How many real numbers exist between 1 and 5

3

The number pi is

Irrational

The number square root 2 is

Irrational

Range the relation $\{(0,1)(3,22),(90,34)\}$

$\{0,3,90\}$

Spherical coordinate 0 is related to the cylindrical coordinate as _____

$@=@$

Operation of subtraction is a binary operation on the set _____

Integers

Let $A = \{1,2,3,4\}$ and $R = \{(1,2), (2,3), (3,3), (3,4)\}$ be a relation on A . Then which one of the following ordered pair has made R not an irreflexive relation?

$(3,3)$

Input values of the function are called the _____

Domain

Range of function $f(x) = |x|$ will be

Set of positive real numbers

If a relation $R = \{(1,1), (2,1), (2,2)\}$ is given then which of the following is not true about this relation

R is irreflexive

Let R and S be transitive relations on a set A then _____

Neither $R \cup S$ is transitive nor $R \cap S$ is transitive

Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Domain of the inverse of the relation is _____

$\{2,4,6,8\}$

Let $A = \{1,2,3,4,5\}$ and $B = \{4,9,16,17,25\}$. Then the relation $R = \{(2,4), (3,9), (4,16), (5,17)\}$ The inverse of R is'

$\{(4,2), (9,3), (16,4), (17,5)\}$

Let R be a relation on a set A . If R is symmetric then its complement is _____

Irreflexive

Which is not a binary operation on the set of natural numbers $\mathbb{N}$?

Subtraction

If a relation $R = \{(1,1)(2,1)(1,2)(2,2)\}$ is given then which of the following is not true about this relation.

R is irreflexive

$R = \{(a,1)(b,2)(c,3)(d,4)\}$ then the inverse of this relation is _____

$\{(1,a)(2,b)(3,c)(4,d)\}$

For any set A , the Cartesian product of A and A is known as _____

Universal relation

Let $A = \{p,q,r,s\}$ and define a relation R on A by $R = \{(p,p),(p,r),(q,r),(q,s),(r,s)\}$ Then which one of the following is the correct statement about R :

R is not reflexive

$A = \{1,2\}$ $B = \{3,4\}$, $R = \{(1,3)(2,4)\}$. Then the complement of R is _____.

$\{(1,4)(2,3)\}$

Domain of a relation symbolically written as _____.

$\text{Dom}(R) = \{a \in A \mid (a,b) \in R\}$

Let $X=\{2,4,5\}$ and $Y=\{1,2,4\}$ and R be a relation from X to Y defined by $R=\{(2,4)(4,1)(a,2)\}$. For what value of 'a' the relation R is a function?

5

Let $A=\{1,2,3,4,5,6,7,8,9\}$, then which of the following sets represent the partition of the set A ?

$A=\{1,3,5,7,9\}$, $B=\{2,4,6\}$, $C=\{8\}$

Let $A=\{1,2,3\}$ and $B=\{2,4\}$ then number of binary relations from A to B are _____.

64

A relation R is said to be _____ iff it is reflexive, antisymmetric and transitive.

Partial order Relation

Let f be a function from $X=\{2,4,5\}$ to $Y=\{1,2,4,6\}$ defined as: $f=\{(2,6),(4,2),(5,1)\}$. The range of f is _____

{1,2,6}

Let $A=\{0,1,2\}$ and $R=\{(0,2),(1,1),(2,0)\}$ be a relation on A . Then which of the following statement about R is true?

R is symmetric

Let $A=\{2,3,4\}$ and $B=\{2,6,8\}$ and let R be the “divides” relation from A to B i.e for all (a,b) belong to (Cartesian product of A and B), $a,R b$ iff $a \mid b$ (a divides b). Then

$$R = \{(2,2), (2,6), (2,8), (3,6), (4,8)\}$$

Let $A = \{1, 2, 3, \dots, 50\}$ and $B = \{2, 4, 6, 8, 10\}$. Then the Cartesian product of A and B has _____ elements.

250

In the matrix representation of an reflexive relation all the entries in the main diagonal are _____

1

Which of the following is not a type of a relation?

Permutation

Let $X = \{2, 4, 5\}$ and $Y = \{1, 2, 4\}$ and R be a relation from X to Y defined by $R = \{(2, 4), (4, 1), (a, 2)\}$. For what value of 'a' the relation R is a function ?

5

Which of the following is not a representation of a relation?

Venn diagram

Let $A = \{1, 2, 3, 4\}$ and define the following relations on A. Then $R = \{(1, 3), (1, 4), (2, 3), (2, 4), (3, 1), (3, 4)\}$ is _____

R is irreflexive

The range of $f: X \rightarrow Y$ is also called the image of

True

Complementary Relation symbolically written as _____

$R = A * B - R = \{(a,b) \in A * B \mid (a,b) \text{ not belong to } R\}$

Let $A = \{1,2,3,4\}$ and $R = (1,1)(2,2),(3,3),(4,4)$ then R is

All options

If a relation $R = \{(1,1),(2,1),(1,2),(2,2)\}$ is given then which of the following is not true about this relation.

R is irreflexive

Which of the following logical connective is not a binary operation?

Implication

A set may be divided up into its disjoint subsets, such division is called_____

Partition

If $A = (1,2,3)$ & $B = (4,5,6)$ and $R = \{(1,4)(2,5)(3,6)(3,4)\}$ The complementary relation is _____

$A * B$ (difference or -) R

In matrix representation of a_____ relation, the diagonal entries are always 1.

Reflexive

R is not symmetric iff there are elements a and b in A such that _____

(a,b) belongs to R but (b,a) does not belong to R

Which relations below are functions?

$R_1 = \{(3,4), (4,5), (6,7), (8,9)\}$

$R_2 = \{(3,4), (4,5), (6,7), (3,9)\}$

$R_3 = \{(-3,4), (4,-5), (0,0), (8,9)\}$

$R_4 = \{(8,11), (34,5), (6,17), (8,19)\}$

R_1 and R_3 are functions

The logic gate OR and AND are uniary operation on $\{0,1\}$

False

There is atleast one loop in the graph of an irreflexive relation

False

There is atleast one loop in the graph of an reflexive relation

True

A contains 3 elements and B contains 2 elements, then number of subsets of $A * B$ are _____

64

Let $A = \{1,2,3\}$ and $B = \{0,1,2\}$ and $C = \{a,b\}$ $R = \{(1,0), (1,2), (3,1), (3,2)\}$

$S = \{(0,b), (1,a), (2,b)\}$ composite of R and S = _____

$\{(1,b), (1,a), (3,a), (3,b)\}$

If R is transitive then the inverse relation will be transitive

True

The number of elements in the power set of $P(\text{not empty set})$ denoted by $P(P(\text{not empty set}))$ is

2

The function defined from Z to Z as $f(x) = 1/(x+2)(x-2)$ is not well defined because _____

Function is not defined at $x=2$ and $x=-2$

Rang of relation $\{(0,1), (3,22), (90,34)\}$ is _____

$\{1, 22, 34\}$

The number of elements in the power set of $P(\text{not empty set})$ denoted by $P(\text{not empty set})$ is

1

Let $R = \{(1,2), (3,4), (5,6), (7,8)\}$. Domain of inverse of the relation is _____

$\{2,4,6,8\}$

The relation 'divides' on the set of integers is _____

A symmetric relation

Operation of subtraction is a binary operation on the set of _____

Integers

If R is transitive then the inverse relation will be transitive.

True

Let $A = \{1, 2, 3, 4\}$ and define the relation R on A by $R = \{(1, 2), (2, 3), (3, 3), (3, 4)\}$. Then _____

R is both reflexive and irreflexive

A set may be divided up into its disjoint subsets, such division is called

Partition

If a set A contains n elements then the number of elements in its power set $P(A)$ is _____

2^n

Range of a relation symbolically written as _____.

$\text{Ran } R = \{b \in B \mid (a, b) \in R\}$

Let R be a binary relation on a set A . If R is anti symmetric then _____.

Inverse of R is anti symmetric

Let A be a set with m elements and B be a set with n elements then the number of elements in $A \times B$ are _____

$m \cdot n$

Let $A = \{1, 2, 3, 4\}$ and define the following relation on A . Then $R = \{(1, 3), (2, 2), (2, 4), (3, 1), (4, 2)\}$ Is _____

R is symmetric

If $A = \{1, 2, 3\}$ & $B = \{4, 5, 6\}$ and $R = \{1, 4\}, \{2, 5\}, \{3, 6\}, \{3, 4\}$. The complementary relation is _____

$A * B$ (difference or $-$) R

Let R be a relation on a set A . If R is reflexive then its complement is _____

Irreflexive

$25 \equiv 1 \pmod{3}$ means that 3 divides _____

25-1

Let R be the universal relation on a set A then which one of the following statement about R is true ?

R is reflexive, symmetric and transitive

Domain of a relation symbolically written as _____

$\text{Dom}(R) = \{a \in R \mid (a, b) \in R\}$

Let R be a relation on a set A . R is transitive if and only if for all $a, b, c \in A$ then

$(a, b) \in R$ and $(b, c) \in R$ then $(a, c) \in R$

Let A be a non-empty set and $P(A)$ the power set of A . Define the 'subset' relation, $\subset$ as follows for all $X, Y \in P(A)$, $X \subset Y \iff$ for all x , iff $x \in X$ then $x \in Y$. Then $\subset$ is _____

$\subset$ is partial order relation

Define a relation $R=\{(1,1),(2,2),(3,3),(1,3)\}$ the relation is

R is reflexive and transitive

Let R be a relation on a set A . R is transitive if and only if for all $a,b,c \in A$ then.

$(a,b) \in R$ and $(b,c) \in R$ then $(a,c) \in R$

Let R and S be reflexive relations on a set A then $R \cap S$ is reflexive

True

A function whose range consists of only one element is called _____

One to one function

The set Z of all integers is _____

Countable

One-to-one correspondence means the condition of _____

Both (a) and (c)

Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$, Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true $f(9)$ to make it a one-to-one (injective) function?

4

What will be the fourth term of the following sequence $1/2, 2/3, 3/4$ _____?

4/5

The value of $6!$ =

720

A constant function is one to one iff its _____ is a singleton.

Domain

A constant function is onto iff its _____ is a singleton.

Co-domain

Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____.

2

If f is defined recursively by $f(0) = -1$ and $f(n+1)=f(n)+3$, then

$f(2)$ = _____.

5

A function whose inverse function exists is called a/an _____.

Invertible function

Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is.....

3

Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Onto

Composition of a function is a commutative operation.

False

Composition of a function is not a commutative operation

True

The sum of first five whole number is _____.

10

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

Inverse of a surjective function is always a function.

False

Inverse of a surjective function may not be a function

True

Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

Co-domain of f must contain 3 elements

If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions. Then $g \circ f: X \rightarrow Z$ is _____

onto

If f and g are two one-to-one functions, then their composition $g \circ f$ is _____.

One-to-one

If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____.

$(h \circ g) \circ f = h \circ (g \circ f)$

Cardinality of positive prime numbers less than 20 is _____.

8

If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

X

$0! =$ _____.

1

An important data type in computer programming consists of _____.

Finite sequences

Let $f(x) = 2x$ and $g(x) = x + 2$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f \circ g)(x)$ is _____.

$x - 2$

The total number of terms in an arithmetic series $0+5+10+15+\dots+50$ are _____.

11

$9!/6! =$ _____

504

Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, THEN $(F+G)(X)$ is _____

$6x-2$

If f is a bijective function then $(f^{-1}f(x))$ is equal to

X

A sequence whose terms alternate in sign is called an_____

Alternating sequence

Common ratio in the sequence “4, 16, 64, 256,...” is.....12.

4

0.8181818181 is a infinite geometric series.

True

The word ‘algorithm’ refers to a step-by-step method for performing some action.

True

A predicate become _____ when its variables are given specific values

Sentence

The sum of two irrational numbers must be an irrational number.

False

The sum of two irrational numbers need not be irrational number

True

The division by zero is allowed in mathematics.

False

The product of any two consecutive positive integers is divisible by 2

True

If 'n' is an odd integer then n^{3+n} is _____.

Even

For integers a,b,c, If divides b and a divides c, then a divides (a+b).

False

Quotient remainder theorem states that for any positive integer d, there exist unique integer q and r such that _____ and $0 < r < d$

$N = d \cdot q + r$

A rule that assigns a numerical value to each outcome in a sample space is called

Random variable

If A and B are two disjoint (mutually exclusive) events then $P(A \cap B) =$

$$P(A) + P(B)$$

How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

$$C(10,5)$$

The expectation of x is equal to

$$\sum x f(x)$$

If $P(A \cap B) = P(A) P(B)$ THEN THE events A and B are called

Independent

A walk that starts and ends at the same vertex is called.

None options

How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

$$497$$

What is the probability of getting a number greater than 4 when a die is thrown?

3/5

Euler formula for graphs is_____.

$F = e - v + 2$

$X + a, x + 3a, x + 5a, \dots$ is an_____

Arithmetic sequence

Composition of a function is a commutative operation.

False

Real valued function is a function that assigns _____ to each member of its domain.

Only a real number

Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined on X
 $f(1)=1, f(2)=2, f(3)=3, f(4)=4$ then _____

f is an identity function

A constant function is surjective if and only if _____

The co-domain consists of a single element

Cardinality means the total number of elements in a set.

True

If $f(x)=2x$ and $g(x)=x$ then $g(f(x))$ is _____.

$2x^2$

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c \circ f$, c is not equal 0 is also one to one function.

True

Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined from X to X by $f(1)=1$, $f(2)=1$, $f(3)=1$, $f(4)=1$ then which of the following is true?

F is a constant function

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

$F(x) = x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}^+$

True

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c \circ f$ c is not equal to 0 is also one to one function.

True

Let $f(x) = x+2$ then $f^{-1}(x)$ is _____

$x-2$

Let $f(x) = x^2 + 1$ define functions f from $\mathbb{R}$ to $\mathbb{R}$ and $c=2$ be any scalar, then $c \circ f(x)$ is _____.

2x2

-1 One to one correspondence means the condition of _____.

Both (a) and (c)

A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \text{square root } x$ is a real valued function.

False

If $g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x) = e^x$ is a real valued function of a real variable.

True

A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \log x$ is a real valued function

True

$\frac{1}{2}$, then 3rd term of sequence is _____.

$\frac{1}{2}$

The process of defining an object in terms of smaller versions of itself is called recursion.

True

Which of the following is not correct for a 'sequence'?

A sequence is a relation whose domain is the set of natural numbers

A set is called countable if, and only if, it is _____.

Finite and countable infinite.....both

A set that is not countable is called _____.

Uncountable

A sequence whose terms alternate in sign is called an _____.

Alternating sequence

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c \cdot f$ is also one to one function for _____.

C is not equal 0

Let $f(x) = x+3$ then $f^{-1}(x)$ is _____.

$x-3$

Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

$2x+3$

Number of one to one functions from $X=\{a,b\}$ to $Y=\{u,v\}$ are equal to _____

2

The fibonacci sequence is defined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$ for all integers $k \geq 2$ then which of the following is true for F_2

$F_2 - F_1 = 2 + 1 = 3$

$x+a, x+3a, x+5a, \dots$ is a/an_____.

Arithmetic sequence

Inverse of a function may not be a function.

True

In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be _____.

$\frac{1}{2}$

If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is also one to one function.

False

If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is not one to one function.

True

The function 'f' and 'g' are inverse of each other if and only if their

composition gives_____.

Identity function

Which of the following set is the domain of a sequence?

Set of real numbers

Let C is defined as the set of all countries in the world then C is a _____.

Finite set

A constant function is surjective if and only if_____.

The co domain consists of a single element

Inverse of a function may not be a function.

True

Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1$, $f(2)=1$, $f(3)=1$, $f(4)=1$ then which of the following is true?

F is a constant function

The composition of function is always

Associative

A set is countably infinite if, and only if, it has the same cardinality as the set of

Positive integers

Two functions 'f' and 'g' from 'X' to 'Y' are said to be equal if and only if _____.

$F(x)=g(x)$ for all 'x' belongs to X

$Y=x^3$ is a graph of bijective function from R to R.

True

Domain and range are same for_____.

Identity function

Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by $f(1)=1, f(2)=2, f(3)=3$

F is an identity function

Composition of a function is a commutative operation.

True

Inverse of a surjective function is always a function.

False

A function whose inverse function exists is called a/an_____.

Invertible

Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X . Then_____.

I is both injective and surjective

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is a one to one function then $c \cdot f$ is also one to one function for.

C is not equal 0

Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true for f(9) to make it a one-to-one (injective) function?

4

Which of the following is not a predecessors of ak?
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A_{k+1}

Two functions 'f' and 'g' from X to Y are said to be equal if and only if_____.

$F(x)=g(x)$ for all 'x' belongs to x

The two functions 'f' and 'g' are equal if _____.

$F(x) = 3x$ and $g(x) = 6x^2$

$+3x/2x^2 + 1$ for all $x \in \mathbb{R}$ If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rd ter, of sequence.

$\frac{1}{4}$

Two functions 'f' and 'g' from x to y are said to be equal if and only if _____.

$F(x)=g(x)$ for all 'x' belongs to x

Common ration in sequence '36, 12, 4 , $\frac{4}{3}$, ' is

$\frac{1}{3}$

A set is called finite if, and only if, is the _____ or there is -----

Empty set or one-to-one

Let $f(X)=x^2-1$ and $g(x)=x+1$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f/g)x$

$x-1$

A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

$Y = \sqrt{x}$ is an _____ function from $\mathbb{R}^+$ to $\mathbb{R}$

One to one function

$Y = x^2$ is an _____ function from $\mathbb{R}$ to $\mathbb{R}^+$

NOT ONE TO ONE FUNCTION

If a function $(g \circ f)(x) : X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$,

Then the function _____.

(gof)

If 0 is the first term and -2 be the common difference of an arithmetic series, then the sum of first five terms of series is _____.

-20

If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

X

$f: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

What does 'r' denotes in a geometric sequence?

Common ratio

Let g be a function defined by $g(x)=x+1$. Then the composition of (gog) .

$X+2$

A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

True

Which of the following is true for the following sequence?

If n is even, then $C_n=2$ and if n is odd, then $C_n=0$

The function ' f ' and ' g ' are inverse of each other if and only if their composition gives_____.

Identity function

$N!$ is defined to be _____.

The product of the integers from 1 to n

Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

Both one to one and onto

A set is called countable if, and only if, it is _____.

Countably infinite and finite

If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

False

If a is the 1st term and d be the common difference of an arithmetic

sequence then the sequence is $a, a+d, a+2d, a+3d, \dots$

True

$x+a, x+3a, x+5, \dots$ is a/an_____.

Arithmetic sequence

inverse of an injective function may not be a function.

True

$y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$

False

Let g be a function defined by $g(x) = x+1$. Then the composition of

$(g \circ g)$.

$X+2$

$f: X \rightarrow Y$ that is both one to one and onto is called a _____.

Bijjective function

What does 'r' denotes in a geometric sequence?

Common ratio

Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

Both one to one and onto

$N!$ is defined to be _____.

The product of the integers from 1 to n

A set is called countable if, and only if, it is _____.

Both b and c

Which of the following is the example of an alternating sequence?

$C_n = n/n+1$ for $n > 0$

$X+a, x+3a, x+5a, \dots$ is an _____

Arithmetic sequence

$0, -5, -10, -15, \dots$ is an _____.

Arithmetic sequence

$5, 9, 13, 17, \dots$ is an _____.

Arithmetic sequence

An important data type in computer programming consists of _____.

Finite sequence

One-to-one correspondence means the condition of _____.

One-one and onto ...both

Cardinality means the total number of elements in a set.

True

Inverse of a function may not be a function.

True

The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

A set is called finite if , and only if, it is the _____ or there is _____.

Empty set or one-to-one

Let f and g be the two functions from $\mathbb{R}$ to $\mathbb{R}$ defined by $f(x) = |x|$ and $g(x) = \text{square root } x^2$ for all $x \in \mathbb{R}$, then _____.

f(x) is not equal to g(x)

If $f^{-1}(x) = 6 - x/2$ then $f^{-1}(2)$ is _____.

2

Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

3

An important data type in computer programming consists of _____

Finite sequence

Let $f(x)=x+3$ then $f^{-1}(x)$ is _____.

X-3

If $f:X \rightarrow Y$ and $g:Y \rightarrow Z$ are both onto function. Then $g \circ f : X \rightarrow Z$ is _____.

One-to-one function

The functions 'f' and 'g' are inverse of each other if and only if their

composition gives

Identity function

The two function 'f' and 'g' are equal if _____.

$f(x) = 3x$ and $g(x) = 6x^2$

$+3x/2x+1$ for all $x \in \mathbb{R}$ Two functions 'f' and 'g' from X To Y are said to be equal if and only if-----.

$f(x)$ and $g(x)$ for all 'x' belongs to X

Which of the following set is the domain of a sequence?

Set of natural numbers

If 1st term of a geometric sequence is 2 and common ratio is $1/2$, then 3rd term of sequence is _____.

$1/2$

Composition of a function is a commutative operation.

True

If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$.

Then the function _____ is known as composition of f and g .

$(g \circ f)$

A set is countably infinite if and only if and only if, it has the same cardinality as the set of _____.

Positive integers

The 3rd term of the sequence $b_n = 5^n$ is _____.

125

Irreflexive

If A = Set of students of virtual university then A has been written in the _____.

Descriptive form

If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g .

$(g \circ f)$

If f is a bijective function then $(f^{-1}(f(x)))$ Is equal to _____.

X

Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is _____.

0

An infinite sequence may have only a finite number of values.

True

The functions $f \circ g$ and $g \circ f$ are always equal .

False

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

True

A function whose range consists of only one element is called _____.

Constant function

Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=4$ then which of the following statement about ' f ' is true?

f is both one-to-one and onto

$Y = x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$.

True

A function whose inverse function exists is called a/an_____.

Invertible

Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

$2x + 5$

If r is a positive real number, then the value of r in $3, r, r^2 = -27r$ is

-9

The _____ of the terms of a sequence forms a series.

Sum

The sum of first five whole number is _____.

10

If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1$, $f_1 = 2$, then $f_2 =$ _____.

3

Let $f(x) = 3x$ and $g(x) = x + 2$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f \circ g)(x)$ is _____.AL-JUNAID INSTITUTE GROUP

$3x^2$

+ 6x Let R be a relation on a set A . If R is reflexive then its complement is _____.

If X and Y are independent random variables and a and b are constants, then $\text{Var}(aX + bY)$ is equal to

$a^2\text{Var}(X) + b^2\text{Var}(Y)$

Let $A = \{1, 2, 3\}$ and $B = \{2, 4\}$ then number of functions from A to B are _____.

8

p is equivalent to q means _____.

p is necessary and sufficient for q .

Let A and B be subsets of U with $n(A) = 12$, $n(B) = 15$, $n(A') = 17$, and $n(A \cap B) = 8$, then $n(U) =$ _____ .

29

For the following relation to be a function, x can not be what values? $R = \{(2,4), (x,1), (4,2), (5,6)\}$

x cannot be 2, 4 or 5

Find the number of the word that can be formed of the letters of the word "ELEVEN".

120

There are three bus lines between A and B , and two bus lines between B and C . Find the number of ways a person can travel round trip by bus from A to C by way of B ?

6

If A and B be events with $P(A) = 1/3$, $P(B) = 1/4$ and $P(A \cap B) = 1/6$, then $P(A \cup B) =$ _____ .

5/12

an integer n is a perfect square if and only if _____ for some integer k .

$$n = k^2$$

If A and B are disjoint finite sets then $n(A \cup B) = \underline{\hspace{2cm}}$.

$$n(A) + n(B)$$

Let $X = \{2, 4, 5\}$ and $Y = \{1, 2, 4\}$ and R be a relation from X to Y defined by $R = \{(2,4), (4,1), (a,2)\}$. For what value of 'a' the relation R is a function ?

5

Among 20 people, 15 either swim or jog or both. If 5 swim and 6 swim and jog, how many jog?

16

A predicate becomes _____ when its variables are given specific values.

statement

Find the number of distinct permutations that can be formed using the letters of the word "BENZENE"

420

Suppose there are 8 different tea flavors and 5 different biscuit brands. A guest wants to take one tea and one brand of biscuit. How many choices are there for this guest?

40

In how many ways a student can choose one of each of the courses when he is offered 3 mathematics courses, 4 literature courses and 2 history courses.

24

If $p \leftrightarrow q$ is True, then _____.

p and q both are True.

$\sim(P \rightarrow q)$ is logically equivalent to _____.

p $\wedge$ $\sim$ q

A tree is normally constructed from _____.

left to right

A Random variable is also called a _____.

Chance Variable

The conjunction $p \wedge q$ is True when _____.

p is True, q is True

The logical statement $p \wedge q$ means _____.

p AND q

Which of the followings is the factorial form of $5 \cdot 4$?

5!/3!

What is the minimum number of students in a class to be sure that two of them are born in the same month?

13

If p is false and q is true, then $\sim p \leftrightarrow q$ is _____.

True

Let $f(x) = x^2 + 1$ define functions f from $\mathbb{R}$ to $\mathbb{R}$ and $c = 2$ be any scalar, then $c \cdot f(x)$ is _____.

$2x^2 + 2$

The disjunction of p and q is written as _____.

$p \vee q$

If X and Y are independent random variables, then $E(XY)$ is equal to

$E(x)E(y)$

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

TRUE

$(p \vee \sim p)$ is the _____.

Tautology

$(-2)! = \text{_____} ?$

Undefined

If p = It is raining, q = She will go to college

"It is raining and she will not go to college"

will be denoted by

$$p \wedge \sim q$$

Let $X = \{1, 2, 3\}$, then 2-combinations of the 3 elements of the set X are _____?

$\{1, 2\}, \{1, 3\}$ and $\{2, 3\}$

How many possible outcomes are there when a fair coin is tossed four times?

16

Which of the followings is the product set $A * B * C$? where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

$\{(a, b, c), (a, b, d)\}$

The number of the words that can be formed from the letters of the word, "COMMITTEE" are

$$9! / (2!2!2!)$$

One-to-One correspondence means the condition of _____.

One-One and onto

The functions $f \circ g$ and $g \circ f$ are always equal.

FALSE

If order matters and repetition is allowed, then which counting method should be used in order to select 'k' elements from a total of 'n' elements?

K-Sample

Determine values of x and y, where $(2x, x + y) = (8, 6)$.

x = 4 and y = 2

Let g be a function defined by $g(x) = x + 1$. Then the composition of $(g \circ g)(x)$ is _____.

x + 2

What is the truth value of the sentence?

'It rains if and only if there are clouds.'

False

Reductio and absurdum' is another name of _____.

Proof by contradiction

X belongs to A or x belongs to B, therefore x belongs to _____.

A union B

Which of the followings is the product set $A * B * C$? Where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

$\{(a, b, c), (a, b, d)\}$

Let $f(x)=3x$ and $g(x) = 3x - 2$ define functions f and g from $\mathbf{R}$ to $\mathbf{R}$.
Then $(f+g)(x) = \underline{\hspace{2cm}}$.

$6x - 2$

The switches in parallel act just like $\underline{\hspace{2cm}}$.

OR gate

The converse of the conditional statement $p \rightarrow q$ is

$q \rightarrow p$

Real valued function is a function that assigns $\underline{\hspace{2cm}}$ to each member of its domain.

Only a real number

The negation of “Today is Friday” is

Today is not Friday

A non-zero integer d divides an integer n if and only if there exists an integer k such that $\underline{\hspace{2cm}}$.

$n = d k$

The statement $p \rightarrow q$ is logically equivalent to $\sim q \rightarrow \sim p$

True

Let R be the universal relation on a set A then which one of the following statement about R is true?

R is reflexive, symmetric and transitive.

If X and Y are random variables, then $E(aX)$ is equal to

$aE(X)$

Which of the following statements is true according to the Division

Algorithm?

$17 = 5 \times 3 + 2$

Let $p \rightarrow q$ be a conditional statement, then the statement $q \rightarrow p$ is called _____.

Converse

The disjunction $p \vee q$ is False when _____.

P is False, q is False.

A student can choose a computer project from one of the two lists. The two lists contain 12 and 18 possible projects, respectively. How many possible projects are there to choose from?

30

A box contains 5 different colored light bulbs. Which of the followings is the number of ordered samples of size 3 with replacement?

125

The converse of the conditional statement 'If I live in Quetta, then I live in Pakistan' is _____.

If I live in Pakistan, then I live in Quetta.

The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

Identity function

$P(0, 0) = \text{_____?}$

1

Let p_1, p_2, p_3 be True premises in a given Truth Table. If the conjunctions of the Conclusion with each of p_1, p_2, p_3 are True, then the argument is _____

Valid

If p is false and q is false, then $\sim p$ implies q is _____.

False

Let $A = \{2, 3, 5, 7\}$, $B = \{2, 3, 5, 7, 2\}$, $C =$ Set of first five prime numbers. Then from the following which statement is true ?

$A = B$

The set of prime numbers is _____.

Infinite set

The contrapositive of the conditional statement 'If it is Sunday, then I go for shopping' is _____.

I do Not go for shopping, then it is Not Sunday.

Let p be True and q be True, then $(\sim p \wedge q)$ is _____.

False

In how many ways a student can choose a course from 2 science courses, 3 literature courses and 5 art courses.

30

The method of loop invariants is used to prove _____ of a loop with respect to certain pre and post-conditions.

correctness

A student is to answer five out of nine questions on exams. Find the number of ways that can choose the five questions

126

If A and B are any two sets, then $A - B = B - A$

False

There are 5 girls' students and 20 boys students in a class. How many students are there in total?

25

If a relation $R = \{(1,1), (2,1), (1,2), (2,2)\}$ is given then which of the following is not true about this relation.

- **R is irreflexive**

Which of the following logical connective is not a binary operation ?

- **Implication**

A set may be dividend up into its disjoint subsets, such division is called_____

- **Partition**

If $A=(1,2,3)$ & $B=(4,5,6)$ and $R = \{(1,4)(2,5)(3,6)(3,4)\}$ The complementary relation is _____

- **$A*B$ (difference or $-$) R**

In matrix representation of a _____ relation, the diagonal entries are always 1.

- **Reflexive**

R is not symmetric iff there are elements a and b in A such that _____

- **(a,b) belongs to R but (b,a) does not belong to R**

Which relations below are functions?

$R1=\{(3,4),(4,5),(6,7),(8,9)\}$

$R2=\{(3,4),(4,5),(6,7),(3,9)\}$

$R3=\{(-3,4),(4,-5),(0,0),(8,9)\}$

$R4=\{(8,11),(34,5),(6,17),(8,19)\}$

- **$R1$ and $R3$ are functions**

The logic gate OR and AND are uniary operation on $\{0,1\}$

- **False**

There is atleast one loop in the graph of an irreflexive relation

- **False**

There is atleast one loop in the graph of an reflexive relation

- True

A contains 3 elements and B contains 2 elements, then number of subsets of $A \times B$ are _____

- 64

Let $A = \{1, 2, 3\}$ and $B = \{0, 1, 2\}$ and $C = \{a, b\}$ $R = \{(1, 0), (1, 2), (3, 1), (3, 2)\}$
 $S = \{(0, b), (1, a), (2, b)\}$ composite of R and S = _____

- $\{(1, b), (1, a), (3, a), (3, b)\}$

If R is transitive then the inverse relation will be transitive

- True

The number of elements in the power set of P(not empty set) denoted by $P(P(\text{not empty set}))$ is

- 2

The function defined from $\mathbb{Z}$ to $\mathbb{Z}$ as $f(x) = 1/(x+2)(x-2)$ is not well defined because _____

- Function is not defined at $x=2$ and $x=-2$

Rang of relation $\{(0, 1), (3, 22), (90, 34)\}$ is _____

- $\{1, 22, 34\}$

The number of elements in the power set of P(not empty set) denoted by $P(P(\text{not empty set}))$ is

- 1

Let $R = \{(1, 2), (3, 4), (5, 6), (7, 8)\}$. Domain of inverse of the relation is _____

- $\{2, 4, 6, 8\}$

The relation 'divides' on the set of integers is _____

- A symmetric relation

Operation of subtraction is a binary operation on the set of _____

- Integers

If R is transitive then the inverse relation will be transitive.

- True

Let $A = \{1, 2, 3, 4\}$ and define the relation R on A by $R = \{(1, 2), (2, 3), (3, 3), (3, 4)\}$. Then _____

- R is both reflexive and irreflexive

A set may be divided up into its disjoint subsets, such division is called

- Partition

If a set A contains n elements then the number of elements in its power set $P(A)$ is _____

- 2^n

Range of a relation symbolically written as _____.

- $\text{Ran } R = \{b \in B \mid (a, b) \in R\}$

Let R be a binary relation on a set A . If R is anti symmetric then _____.

- Inverse of R is anti symmetric

Let A be a set with m elements and B be a set with n elements then the number of elements in $A \times B$ are _____

- $m \cdot n$

Let $A = \{1, 2, 3, 4\}$ and define the following relation on A . Then $R = \{(1, 3), (2, 2), (2, 4), (3, 1), (4, 2)\}$ Is _____

- R is symmetric

If $A = \{1, 2, 3\}$ & $B = \{4, 5, 6\}$ and $R = \{(1, 4), (2, 5), (3, 6), (3, 4)\}$. The complementary relation is _____

- $A \times B$ (difference or $-$) R

Let R be a relation on a set A . If R is reflexive then its complement is _____

- Irreflexive

$25 \equiv 1 \pmod{3}$ means that 3 divides _____

- 25-1

Let R be the universal relation on a set A then which one of the following statement about R is true ?

- R is reflexive, symmetric and transitive

Domain of a relation symbolically written as _____

- $\text{Dom}(R) = \{a \in R \mid (a,b) \in R\}$

Let R be a relation on a set A . R is transitive if and only if for all $a,b,c \in A$ then

- $(a,b) \in R$ and $(b,c) \in R$ then $(a,c) \in R$

Let A be a non-empty set and $P(A)$ the power set of A . Define the 'subset' relation, $\subseteq$, as follows for all $X,Y \in P(A)$, $X \subseteq Y \iff$ for all x , iff $x \in X$ then $x \in Y$. Then $\subseteq$ is _____

- $\subseteq$ is partial order relation

Define a relation $R = \{(1,1), (2,2), (3,3), (1,3)\}$ the relation is

- R is reflexive and transitive

Let R be a relation on a set A . R is transitive if and only if for all $a,b,c \in A$ then.

- $(a,b) \in R$ and $(b,c) \in R$ then $(a,c) \in R$

Let R and S be reflexive relations on a set A then $R \cap S$ is reflexive

- True

A function whose range consists of only one element is called _____

- One to one function

The set Z of all integers is _____

- Countable

One-to-one correspondence means the condition of _____

- Both (a) and (c)

Let $X = \{1,5,9\}$ and $Y = \{3,4,7\}$, Define a function f from X to Y such that $f(1)=7, f(5)=3, f(9)=$ _____. Which is true $f(9)$ to make it a one-to-one (injective) function?

- 4

What will be the fourth term of the following sequence $1/2, 2/3, 3/4$ _____?

- $4/5$

The value of $6!$ =

- 720

A constant function is one to one iff its _____ is a singleton.

- Domain

A constant function is onto iff its _____ is a singleton.

- Co-domain

Number of one to one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to _____.

- 2

If f is defined recursively by $f(0) = -1$ and $f(n+1) = f(n) + 3$, then $f(2) =$ _____.

- 5

A function whose inverse function exists is called a/an _____.

- Invertible function

Let $f(2) = 3$, $g(2) = 3$, $f(4) = 1$ and $g(4) = 2$ then the value of $f \circ g(4)$ is.....

- 3

Let $A = \{1, 2, 3, 4\}$ and $B = \{7\}$ then the constant function from A to B is _____.

- Onto

Composition of a function is a commutative operation.

- False

Composition of a function is not a commutative operation

- True

The sum of first five whole number is _____.

- 10

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

- True

Inverse of a surjective function is always a function.

- False

Inverse of a surjective function may not be a function

- True

Let $X = \{1, 2, 3, 4\}$ and $Y = \{7, 8, 9\}$ and let f be function defined from X to Y such that f is onto then which of the following statement about f is true?

- Co-domain of f must contain 3 elements

If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto functions. Then $g \circ f: X \rightarrow Z$ is

- onto

If f and g are two one-to-one functions, then their composition $g \circ f$ is _____

- One-to-one

If $f: W \rightarrow X$, $g: X \rightarrow Y$, and $h: Y \rightarrow Z$ are functions, then _____

- $(h \circ g) \circ f = h \circ (g \circ f)$

Cardinality of positive prime numbers less than 20 is _____.

- 8

If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

- x

$0! =$ _____.

- 1

An important data type in computer programming consists of

_____.

- Finite sequences

Let $f(x)=2x$ and $g(x)=x+2$ define functions f and g from R to R , then $(f-g)(x)$ is _____.

- $x-2$

The total number of terms in an arithmetic series $0+5+10+15+....50$ are _____.

- 11

$9!/6!=$ _____

- 504

Let $f(x)=3x$ and $g(x)=3x-2$ define functions f and g from R to R , THEN $(F+G)(X)$ is _____

- $6x-2$

If f is a bijective function then $(f^{-1}f(x))$ is equal to

- x

A sequence whose terms alternate in sign is called an _____

- Alternating sequence

Common ration in the sequence "4, 16, 64, 256,..." is.....12.

- 4

0.8181818181 is a infinite geometric series.

- True

The word 'algorithm' refers to a step-by-step method for performing some action.

- True

A predicate become _____ when its variables are given specific values

- Sentence

The sum of two irrational numbers must be an irrational number.

- False

The sum of two irrational numbers need not be irrational number

- True

The division by zero is allowed in mathematics.

- False

The product of any two consecutive positive integers is divisible by 2

- True

If 'n' is an odd integer then $n^3 + n$ is _____.

- Even

For integers a, b, c, If b divides a and a divides c, then a divides (a+b).

- False

Quotient remainder theorem states that for any positive integer d, there exist unique integer q and r such that _____ and $0 \leq r < d$

- $N = d \cdot q + r$

A rule that assigns a numerical value to each outcome in a sample space is called

- Random variable

If A and B are two disjoint (mutually exclusive) events then $P(A \cap B) =$

- $P(A) + P(B)$

How many ways are there to select five players from a 10 member tennis team to make a trip to a match to another school?

- $C(10, 5)$

The expectation of x is equal to

- $\sum x f(x)$

If $P(A \cap B) = P(A) P(B)$ THEN THE events A and B are called

- Independent

A walk that starts and ends at the same vertex is called.

- None of these

How many integers from 1 through 1000 are neither multiple of 3 nor multiple of 5

- 497

What is the probability of getting a number greater than 4 when a die is thrown?

- $\frac{3}{5}$

Euler formula for graphs is_____.

- $F = e - v + 2$

$X + a, x + 3a, x + 5a, \dots$ is an_____

- Arithmetic sequence

Composition of a function is a commutative operation.

- False

Real valued function is a function that assigns _____ to each member of its domain.

- Only a real number

Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined on X
 $f(1) = 1, f(2) = 2, f(3) = 3, f(4) = 4$ then _____

- F is an identity function

A constant function is surjective if and only if _____

- The co-domain consists of a single element

Cardinality means the total number of elements in a set.

- True

If $f(x) = 2x$ and $g(x) = x$ then $g(f(x))$ is _____.

- $2x^2$

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f, c is not equal 0 is also one to one function.

- True

Let $X = \{1, 2, 3, 4\}$ and a function 'f' defined from X to X by $f(1) = 1, f(2) = 1, f(3) = 1, f(4) = 1$ then which of the following is true?

- F is a constant function

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

- True

Which of the following is not correct for a 'sequence'?

- A sequence is a relation whose domain is the set of natural numbers

$F(x)=x^2$ is not one to one function from $\mathbb{R}$ to $\mathbb{R}^+$

- True

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then $c, f \circ c$ is not equal to is also one to one function.

- True

Let $f(x)=x+2$ then $f^{-1}(x)$ is _____

- $x-2$

Let $f(x)=x^2+1$ define functions f from $\mathbb{R}$ to $\mathbb{R}$ and $c=2$ be any scalar, then $c, f(x)$ is _____.

- $2x^2-1$

One to one correspondence means the condition of _____.

- Both (a) and (c)

A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \text{square root } x$ is a real valued function.

- False

If $g: \mathbb{R} \rightarrow \mathbb{R}$ defined by $g(x)=e^x$ is a real valued function of a real variable.

- True

A function $F: \mathbb{R} \rightarrow \mathbb{R}$ defined by $f(x) = \log x$ is a real valued function

- True

$\frac{1}{2}$, then 3rd term of sequence is _____.

- 1/2

The process of defining an object in terms of smaller versions of itself is called recursion.

- True

Which of the following is not correct for a 'sequence'?

- A sequence is a relation whose domain is the set of natural numbers

A set is called countable if, and only if, it is _____.

- Finite and countable infinite.....both

A set that is not countable is called _____.

- Uncountable

A sequence whose terms alternate in sign is called an _____.

- Alternating sequence

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ is one to one function then c, f is also one to one function for _____.

- C is not equal 0

Let $f(x) = x+3$ then $f^{-1}(x)$ is _____.

- $x-3$

Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

- $2x+3$

Number of one to one functions from $X = \{a, b\}$ to $Y = \{u, v\}$ are equal to _____.

- 2

The fibonacci sequence is defined as $F_0=1, F_1=1, F_k=F_{k-1}+F_{k-2}$ for all integers $k \geq 2$ then which of the following is true for F_2

- $F_2 - F_1 = 2+1=3$

$x+a, x+3a, x+5a, \dots$ is a/an _____.

- Arithmetic sequence

Inverse of a function may not be a function.

- True

In the following sequence $a_k = K/(k+1)$, for $k=1$, a_1 will be _____.

- $1/2$

If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is also one to one function.

- False

If $f(x)=x$ and $g(x)=-x$ are both one to one function then $(f+g)(x)$ is not one to one function.

- True

The function 'f' and 'g' are inverse of each other if and only if their composition gives_____.

- Identity function

Which of the following set is the domain of a sequence?

- Set of real numbers

Let C is defined as the set of all countries in the world then C is a _____.

- Finite set

A constant function is surjective if and only if_____.

- The co domain consists of a single element

The sum of the series $a_1 + a_2 + a_3 + \dots$ can be written as _____.

-

Inverse of a function may not be a function.

- True

- 3

Let $X=\{1,2,3,4\}$ and a function 'f' defined from X to X by $f(1)=1$, $f(2)=1$, $f(3)=1$, $f(4)=1$ then which of the following is true?

- **F is a constant function**

The composition of function is always

- **Associative**

A set is countably infinite if, and only if, it has the same cardinality as the set of

- **Positive integers**

Two functions 'f' and 'g' from 'X' to 'Y' are said to be equal if and only if _____.

- **$F(x)=g(x)$ for all 'x' belongs to X**

$Y=x^3$ is a graph of bijective function from R to R.

- **True**

Domain and range are same for_____.

- **Identity function**

Let $X=\{1,2,3,4\}$ and a function 'f' defined on X by $f(1)=1, f(2)=2, f(3)=3$

- **F is an identity function**

Composition of a function is a commutative operation.

- **True**

Inverse of a surjective function is always a function.

- **False**

A function whose inverse function exists is called a/an_____.

- **Invertible**

Given a set X define a function I from X to X by $i(x)=x$ from all x belonging to X . Then_____.

- **I is both injective and surjective**

Let $f: R \rightarrow R$ is a one to one function then c, f is also one to one function for.

- **C is not equal 0**

Let $X=\{1,5,9\}$ and $Y=\{3,4,7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=$ _____. Which is true for $f(9)$ to make it a one-to-one (injective) function?

- 4

Which of the following is not a predecessors of a_k ?

- A_k+1

Two functions ' f ' and ' g ' from X to Y are said to be equal if and only if _____.

- $F(x)=g(x)$ for all ' x ' belongs to x

The two functions ' f ' and ' g ' are equal if _____.

- $F(x) = 3x$ and $g(x) = \frac{6x^2+3x}{2x^2+1}$ for all $x \in \mathbb{R}$

If first term of a geometric sequence is 2 and common ratio is $\frac{1}{2}$, then 3rd ter, of sequence.

- $\frac{1}{4}$

$Y = \sqrt{x}$ is an _____ function form $\mathbb{R}^+$ to $\mathbb{R}$

- One to one function

$Y = x^2$ is an _____ function form $\mathbb{R}$ to $\mathbb{R}^+$

- NOT ONE TO ONE FUNTION

If a function $(g \circ f)(x) : X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$, Then the function _____.

- $(g \circ f)$

If 0 is the first term and -2 be the common difference of an arithmetic series, then the sum of first five terms of series is _____.

- -20

If $f(x) = \sin^{-1}(x)$ and $g(x) = \sin x$ then $g \circ f(x)$ is _____.

- X

$F: X \rightarrow Y$ that is both one to one and onto is called a _____.

- Bijective function

What does 'y' denotes in a geometric sequence?

- **Common ratio**

Let g be a function defined by $g(x)=x+1$. Then the composition of (gog) .

- **$X+2$**

A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

- **True**

Which of the following is true for the following sequence?

- **If n is even, then $C_n=2$ and if n is odd, then $C_n = 0$**

The function ' f ' and ' g ' are inverse of each other if and only if their composition gives_____.

- **Identity function**

$N!$ is defined to be _____.

- **The product of the integers from 1 to n**

Let $A = \{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B

- **Both one to one and onto**

A set is called countable if, and only if, it is _____.

- **Countably infinite and finite**

If $f(x) = x$ and $g(x) = -x$ are both one to one functions then $(f+g)(x)$ is also one to one function.

- **False**

If a is the 1st term and d be the common difference of an arithmetic sequence then the sequence is $a, a+d, a+2d, a+3d....$

- **True**

$x+a, x+3a, x+5.....$ is a/an _____.

- **Arithmetic sequence**

inverse of an injective function may not be a function.

- True

$y=x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$

- False

Two functions 'f' and 'g' from x to y are said to be equal if and only if _____.

- $F(x)=g(x)$ for all 'x' belongs to x

Common ratio in sequence '36, 12, 4, $\frac{4}{3}$, ' is

- $\frac{1}{3}$

A set is called finite if, and only if, is the _____ or there is _____.

- Empty set or one-to-one

Let $f(x)=x^2-1$ and $g(x)=x+1$ define functions f and g from $\mathbb{R}$ to $\mathbb{R}$, then $(f/g)x$

- $x-1$

A graph of a function f is one to one iff every horizontal line intersects the graph in at most one point.

- True

Let g be a function defined by $g(x) = x+1$. Then the composition of (gog).

- $x+2$

$f:X \rightarrow Y$ that is both one to one and onto is called a _____.

- Bijective function

What does 'I' denotes in a geometric sequence?

- Common ratio

Let $A=\{1,2,3,4\}$ and $B=\{7\}$ then the constant function from A to B is _____.

- Both one to one and onto

$n!$ is defined to be _____.

- The product of the integers from 1 to n

A set is called countable if, and only if, it is _____.

- Both b and c

Which of the following is the example of an alternating sequence?

- $C_n = n/n+1$ for $n \geq 0$

$X+a, x+3a, x+5a, \dots$ is an _____

- Arithmetic sequence

0, -5, -10, -15, ... is an _____.

- Arithmetic sequence

5, 9, 13, 17, ... is an _____.

- Arithmetic sequence

An important data type in computer programming consists of _____.

- Finite sequence

One-to-one correspondence means the condition of _____.

- One-one and ontoboth

Cardinality means the total number of elements in a set.

- True

Inverse of a function may not be a function.

- True

The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

- Identity function

A set is called finite if, and only if, it is the _____ or there is _____.

- Empty set or one-to-one

Let f and g be the two functions from R to R defined by $f(x) = |x|$ and $g(x) = \text{square root } x^2$ for all $x \in R$, then _____.

- $F(x)$ is not equal to $g(x)$

If $f^{-1}(x) = 6 - x/2$ then $f^{-1}(2)$ is _____.

- 2

Let $f(2)=3$, $g(2)=3$, $f(4)=1$ and $g(4)=2$ then the value of $f \circ g(4)$ is _____.

- 3

An important data type in computer programming consists of ____.

- Finite sequence

Let $f(x)=x+3$ then $f^{-1}(x)$ is _____.

- $X-3$

If $f: X \rightarrow Y$ and $g: Y \rightarrow Z$ are both onto function. Then $g \circ f : X \rightarrow Z$ is _____.

- One-to-one function

The functions ' f ' and ' g ' are inverse of each other if and only if their composition gives

- Identity function

The two function ' f ' and ' g ' are equal if _____.

- $F(x) = 3x$ and $g(x) = 6x^2 + 3x/2x + 1$ for all $x \in \mathbb{R}$

Two functions ' f ' and ' g ' from X To Y are said to be equal if and only if—
—.

- $F(x)$ and $g(x)$ for all ' x ' belongs to X

Which of the following set is the domain of a sequence?

- Set of natural numbers

If 1st term of a geometric sequence is 2 and common ratio is $1/2$, then 3rd term of sequence is _____.

- $1/2$

Composition of a function is a commutative operation.

- True

If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g .

- $(g \circ f)$

A set is countably infinite if and only if and only if, it has the same cardinality as the set of _____.

- Positive integers

The 3rd term of the sequence $b_n = 5^n$ is _____.

- 125

If f is a bijective function then $(f^{-1}(f(x)))$ is equal to _____.

- x

Let $f(x) = x$ and $g(x) = -x$ for all $x \in \mathbb{R}$, then $(f+g)(x)$ is _____.

0

An infinite sequence may have only a finite number of values.

- True

The functions $f \circ g$ and $g \circ f$ are always equal .

- False

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

- True

A function whose range consists of only one element is called _____.

- Constant function

Let $X = \{1, 5, 9\}$ and $Y = \{3, 4, 7\}$. Define a function f from X to Y such that $f(1)=7$, $f(5)=3$, $f(9)=4$ then which of the following statement about ' f ' is true?

- f is both one-to-one and onto

$Y = x^3$ is a graph of bijective function from $\mathbb{R}$ to $\mathbb{R}$.

- True

A function whose inverse function exists is called a/an_____.

- Invertible

Let f and g be two functions defined by $f(x) = x+2$ and $g(x) = 2x+1$. Then the composition of f and g is _____.

- $2x + 5$

If r is a positive real number, then the value of r in $3, r, r = -27r$ is

- -9

The _____ of the terms of a sequence forms a series.

- Sum

The sum of first five whole number is _____.

- 10

If $f_k = f_{k-1} + f_{k-2}$ then $f_0 = 1, f_1 = 2$, then $f_2 =$ _____.

- 3

Let $f(x) = 3x$ and $g(x) = x + 2$ define functions f and g from R to R , then $(f.g)(x)$ is _____.

- $3x^2 + 6x$

Let R be a relation on a set A . If R is reflexive then its compliment is _____.

- Irreflexive

If $A =$ Set of students of virtual university then A has been written in the _____.

- Descriptive form

If a function $(g \circ f)(x): X \rightarrow Z$ is defined as $(g \circ f)(x) = g(f(x))$ for all $x \in X$. Then the function _____ is known as composition of f and g .

- $(g \circ f)$

If X and Y are independent random variables and a and b are constants, then $\text{Var}(aX + bY)$ is equal to

- $a\text{Var}(X) + b\text{Var}(Y)$

Let $A = \{1, 2, 3\}$ and $B = \{2, 4\}$ then number of functions from A to B are _____.

- 8

p is equivalent to q' means _____.

- p is necessary and sufficient for q.

Let A and B be subsets of U with $n(A) = 12$, $n(B) = 15$, $n(A') = 17$, and $n(A \cap B) = 8$, then $n(U) =$ _____.

- 29

For the following relation to be a function, x can not be what values?

$R = \{(2,4), (x,1), (4,2), (5,6)\}$

- x cannot be 2, 4 or 5

Find the number of the word that can be formed of the letters of the word "ELEVEN".

- 120

There are three bus lines between A and B, and two bus lines between B and C. Find the number of ways a person can travel round trip by bus from A to C by way of B?

- 6

Among 20 people, 15 either swim or jog or both. If 5 swim and 6 swim and jog, how many jog?

- 16

A predicate becomes _____ when its variables are given specific values.

- statement

Find the number of distinct permutations that can be formed using the letters of the word "BENZENE"

- 420

Suppose there are 8 different tea flavors and 5 different biscuit brands. A guest wants to take one tea and one brand of biscuit. How many choices are there for this guest?

- 40

In how many ways a student can choose one of each of the courses when he is offered 3 mathematics courses, 4 literature courses and 2 history courses.

- 24

If $p \leftrightarrow q$ is True, then _____.

- p and q both are True.

If A and B be events with $P(A) = 1/3$, $P(B) = 1/4$ and $P(A \cap B) = 1/6$, then $P(A \cup B) =$ _____.

- 5/12

an integer n is a perfect square if and only if _____ for some integer k .

- $n = k^2$

If A and B are disjoint finite sets then $n(A \cup B) =$ _____.

- $n(A) + n(B)$

Let $X = \{2, 4, 5\}$ and $Y = \{1, 2, 4\}$ and R be a relation from X to Y defined by $R = \{(2,4), (4,1), (a,2)\}$. For what value of 'a' the relation R is a function ?

- 5

$\sim(P \rightarrow q)$ is logically equivalent to _____.

- $p \wedge \sim q$

A tree is normally constructed from _____.

- left to right

A Random variable is also called a _____.

- Chance Variable

The conjunction $p \wedge q$ is True when _____.

- p is True, q is True

The logical statement $p \wedge q$ means _____.

- p AND q

Which of the followings is the factorial form of $5 \cdot 4$?

- $5!/3!$

What is the minimum number of students in a class to be sure that two of them are born in the same month?

- 13

If p is false and q is true, then $\sim p \leftrightarrow q$ is _____.

- True

If f and g are two one-to-one functions, then their composition that is $g \circ f$ is one-to-one.

- TRUE

$(p \vee \sim p)$ is the _____.

- Tautology

$(-2)! =$ _____ ?

- Undefined

If p = It is raining, q = She will go to college
"It is raining and she will not go to college"
will be denoted by

- $p \wedge \sim q$

Let $X = \{1, 2, 3\}$, then 2-combinations of the 3 elements of the set X are _____?

- $\{1, 2\}, \{1, 3\}$ and $\{2, 3\}$

Let $f(x) = x^2 + 1$ define functions f from R to R and $c = 2$ be any scalar, then $c \cdot f(x)$ is _____.

- $2x^2 + 2$

The disjunction of p and q is written as _____.

- $p \vee q$

If X and Y are independent random variables, then $E(XY)$ is equal to

- $E(x)E(y)$

How many possible outcomes are there when a fair coin is tossed four times?

- 16

Which of the followings is the product set $A * B * C$? where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

- $\{(a, b, c), (a, b, d)\}$

The number of the words that can be formed from the letters of the word, "COMMITTEE" are

- $9! / (2!2!2!)$

One-to-One correspondence means the condition of _____.

- One-One and onto

The functions $f \circ g$ and $g \circ f$ are always equal.

- FALSE

If order matters and repetition is allowed, then which counting method should be used in order to select 'k' elements from a total of 'n' elements?

- K-Sample

Determine values of x and y , where $(2x, x + y) = (8, 6)$.

- $x = 4$ and $y = 2$

Let g be a function defined by $g(x) = x + 1$. Then the composition of $(g \circ g)(x)$ is _____.

- $x + 2$

What is the truth value of the sentence?

'It rains if and only if there are clouds.'

- False

Reductio and absurdum' is another name of _____.

- Proof by contradiction

X belongs to A or x belongs to B, therefore x belongs to _____.

- A union B

Which of the followings is the product set $A * B * C$? Where $A = \{a\}$, $B = \{b\}$, and $C = \{c, d\}$.

- $\{(a, b, c), (a, b, d)\}$

Real valued function is a function that assigns _____ to each member of its domain.

- Only a real number

The negation of "Today is Friday" is

- Today is not Friday

A non-zero integer d divides an integer n if and only if there exists an integer k such that _____.

- $n = dk$

The statement $p \rightarrow q$ is logically equivalent to $\sim q \rightarrow \sim p$

- True

Let R be the universal relation on a set A then which one of the following statement about R is true?

- R is reflexive, symmetric and transitive.

Let $f(x) = 3x$ and $g(x) = 3x - 2$ define functions f and g from R to R. Then $(f+g)(x) = \underline{\hspace{2cm}}$.

- $6x - 2$

The switches in parallel act just like _____.

- OR gate

The converse of the conditional statement $p \rightarrow q$ is

- $q \rightarrow p$

If X and Y are random variables, then $E(aX)$ is equal to

- $aE(X)$

Which of the following statements is true according to the Division Algorithm?

- $17 = 5 \times 3 + 2$

Let $p \rightarrow q$ be a conditional statement, then the statement $q \rightarrow p$ is called _____.

- **Converse**

The disjunction $p \vee q$ is False when _____.

- **P is False, q is False.**

A student can choose a computer project from one of the two lists. The two lists contain 12 and 18 possible projects, respectively. How many possible projects are there to choose from?

- **30**

The converse of the conditional statement 'If I live in Quetta, then I live in Pakistan' is _____.

- **If I live in Pakistan, then I live in Quetta.**

The functions 'f' and 'g' are inverse of each other if and only if their composition gives _____.

- **Identity function**

P (0, 0)=_____?

- **1**

Let p_1, p_2, p_3 be True premises in a given Truth Table. If the conjunctions of the Conclusion with each of p_1, p_2, p_3 are True, then the argument is _____.

- **Valid**

If p is false and q is false, then $\sim p$ implies q is _____.

- **False**

A box contains 5 different colored light bulbs. Which of the followings is the number of ordered samples of size 3 with replacement?

- **125**

Let $A = \{2, 3, 5, 7\}$, $B = \{2, 3, 5, 7, 2\}$, $C =$ Set of first five prime numbers. Then from the following which statement is true ?

- $A = B$

The set of prime numbers is _____.

- Infinite set

The contrapositive of the conditional statement 'If it is Sunday, then I go for shopping' is _____.

- I do Not go for shopping, then it is Not Sunday.

Let p be True and q be True, then $(\sim p \wedge q)$ is _____.

- False

In how many ways a student can choose a course from 2 science courses, 3 literature courses and 5 art courses.

- 30

The method of loop invariants is used to prove _____ of a loop with respect to certain pre and post-conditions.

- correctness

A student is to answer five out of nine questions on exams. Find the number of ways that can choose the five questions

- 126

If A and B are any two sets, then $A - B = B - A$

- False

There are 5 girls students and 20 boys students in a class. How many students are there in total?

- 25