

CARMEL ENGLISH SCHOOL, KALLATA

(Secondary & Senior Secondary School, Affiliated to CBSE, New Delhi)

COVID-19 HOLIDAY HOME ASSIGNMENT

SUBJECT: MATHEMATICS

Date : 15-21 APRIL 2020

RELATIONS AND FUNCTIONS

Part 1

Introduction - Basic Ideas of Relations and fun...: <https://youtu.be/csxE3u2A0Y>

Part 2

Relations, Types of Relations & Functions | Class...: <https://youtu.be/-Yf4yV5Ba38>

Part 3

Composition of Functions & Invertible Functions |...: <https://youtu.be/VZX1mAWlybo>

Part 4

Binary Operations | CBSE 12 Maths NCERT Ex 1.4
in...: <https://youtu.be/Cr79NhYUSfw>

EXERCISE

1. Let $f : \{1, 3, 4\} \rightarrow \{1, 2, 5\}$ and $g : \{1, 2, 5\} \rightarrow \{1, 3\}$ be given by $f = \{(1, 2), (3, 5), (4, 1)\}$ and $g = \{(1, 3), (2, 3), (5, 1)\}$. Write down $g \circ f$.

2. Let f, g and h be functions from R to R . Show that

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

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

3. Determine whether or not each of the definition of $*$ given below gives a binary operation. In the event that $*$ is not a binary operation, give justification for this.

(i) On Z^+ , define $*$ by $a * b = a - b$

(ii) On Z^+ , define $*$ by $a * b = ab$

(iii) On R , define $*$ by $a * b = ab^2$

(iv) On Z^+ , define $*$ by $a * b = |a - b|$

(v) On Z^+ , define $*$ by $a * b = a$

4. State whether the following statements are true or false. Justify.

(i) For an arbitrary binary operation $*$ on a set N , $a * a = a \forall a \in N$.

(ii) If $*$ is a commutative binary operation on N , then $a * (b * c) = (c * b) * a$

5. Consider a binary operation $*$ on N defined as $a * b = a^3 + b^3$. Choose the correct answer.

(A) Is $*$ both associative and commutative?

(B) Is $*$ commutative but not associative?

(C) Is $*$ associative but not commutative?

(D) Is $*$ neither commutative nor associative?