

GOVERNMENT POLYTECHNIC, NAWADA

Course Name : Mathematics-II
Due Date: May 10, 2023

Course Coordinator: Dr. M. K. Singh
Branch: Electrical & Mechanical Engg.

Assignment-1

Notations have their usual meanings. Complete assignment before due time.

1. Let $A = \{1, 2, 3\}$ and $B = \{a, b, c\}$. Which the following relation is a function?

- $R_1 = \{(1, a), (2, b), (3, a)\}$
- $R_2 = \{(1, a), (2, b), (3, d)\}$
- $R_3 = \{(1, a), (2, a), (1, b), (3, c), (2, c)\}$
- $R_4 = \{(1, a), (2, b), (2, a), (3, c), (3, b)\}$

2. Determine whether the following relation is a function:

- $R_1 = \{(x, y) \in \mathbb{R} \times \mathbb{R} : y = x^2 + 1\}$
- $R_2 = \{(x, y) \in \mathbb{R} \times \mathbb{R} : y = \sqrt{x}\}$
- $R_3 = \{(x, y) \in \mathbb{R} \times \mathbb{R} : y = \pm x\}$
- $R_4 = \{(x, y) \in \mathbb{R} \times \mathbb{R} : y = \sin x\}$

3. Let $A = \mathbb{R}$ and $B = \{0, 1\}$. Whether the following relations is a function?

- $R_1 = \{(x, 1) : x \in \mathbb{R}\}$
- $R_2 = \{(x, x^2) : x \in \mathbb{R}\}$

4. Let $A = \{x \in \mathbb{R} \mid x > 0\}$ and $B = \mathbb{R}$. Is the following relation is a function?

$$R = \{(x, \sqrt{x}) : x > 0\}$$

5. Let $A = \{x \in \mathbb{R} \mid x \neq -1\}$ and $B = \mathbb{R}$. Is the following relation is a function?

$$R = \left\{ \left(x, \frac{1}{x+1} \right) : x \in \mathbb{R}, x \neq -1 \right\}$$

6. Let $A = \mathbb{Z}$ and $B = \mathbb{Z}$. Is the following relation is a function?

$$R = \{(x, x+1) \mid x \in \mathbb{Z}\}$$

****Learn Mathematics for Golden Future****