

Tutorial 4: Sets, Relations, Functions

4COSC002W Mathematics for Computing, 4CCGD002W Mathematics for Games Development and 4BUIS002W Business Mathematics TUTORIAL 8 TASKS

Aim: To practice various problem-solving tasks related to relations and functions; revision and catch-up.

Pre-tutorial work (independent study):

1. **Revise:** Lecture 7 and work during Tutorial 7 related to products.
Pages 176 – 181, (sections 16.1 - 16.2) from Croft, T and Davison R (2016) *Foundation maths*, 5th ed. Harlow: Pearson.
2. Try to solve tasks below at home and use tutorial time to check your answers
3. Attempt a mock test on-line on the BB. It is password protected and passwords will be given at your tutorials. The test has 10 questions and the time is limited to 30 minutes. You will only have one attempt and you will see you score straight after the submission. Note that questions have different weight.

Task 1. Let $A = \{a, b, c\}$ and $B = \{1, 0\}$. Which of the following relations is a function with the domain A and the co-domain B

- a) $\{ \langle x, y \rangle \mid x \in B, y \in A \}$
- b) $\{ \langle a, a \rangle, \langle b, b \rangle, \langle c, c \rangle, \langle 1, 1 \rangle, \langle 0, 0 \rangle \}$
- c) $\{ \langle a, 1 \rangle, \langle b, 1 \rangle, \langle c, 1 \rangle \}$
- d) $A \times B$
- e) $\{ \langle x, y \rangle \mid x \in A, y \in B \}$

Task 2.

Let $A = \{ \text{Mary, John, Peter, Chris} \}$ and $B = \{ \text{Accountant, Lawyer, Programmer, Lecturer} \}$.

Which of the following relations is a function with domain A and co-domain B:

- a) $\{ \langle \text{Mary, Accountant} \rangle, \langle \text{John, Lawyer} \rangle, \langle \text{Peter, Programmer} \rangle, \langle \text{Chris, Lecturer} \rangle \}$.
- b) $\{ \langle \text{Mary, Accountant} \rangle, \langle \text{John, Lawyer} \rangle, \langle \text{Peter, Programmer} \rangle, \langle \text{Chris, Programmer} \rangle \}$.
- c) $\{ \langle \text{Mary, Accountant} \rangle, \langle \text{John, Lawyer} \rangle, \langle \text{Peter, Programmer} \rangle \}$.
- d) $\{ \langle \text{Mary, Programmer} \rangle, \langle \text{John, Programmer} \rangle, \langle \text{Peter, Programmer} \rangle, \langle \text{Chris, Programmer} \rangle \}$.
- e) $\{ \langle \text{Mary, Accountant} \rangle, \langle \text{John, Lawyer} \rangle, \langle \text{Peter, Lecturer} \rangle, \langle \text{Peter, Programmer} \rangle, \langle \text{Chris, Programmer} \rangle \}$.