



SECI1013: DISCRETE STRUCTURE
SEM 1 2023/2024

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Marks
14 / 15

Question 1

[3 Marks]

Fill in the blank with correct properties that relation could be reflexive/ irreflexive/ symmetric/ anti-symmetric/ transitive. (One answer only)

- a. Nothing is related to itself irreflexive (1m)
b. No one-way streets symmetric (1m)
c. Whenever there's a roundabout route, there's a direct route transitive (1m)

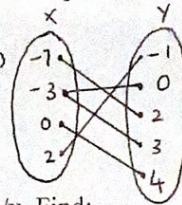
Question 2

[3 Marks]

Given the relation $\{(-7,2), (0,4), (2,-1), (-3,0), (-3,3)\}$

- a. State the domain and range of the relation domain = $\{-7, -3, 0, 2\}$, range = $\{-1, 0, 2, 3, 4\}$ (1m)
b. Determine whether the relation is function and explain (1m)
c. Create a mapping diagram of the relation (1m)

(b) not a function because $f(-3) = 0$ and 3



Question 3

[6 Marks]

Given a pair of functions, $f(x) = 3/(2x+1)$, $g(x) = 2/x$. Find:

- a. $(g \circ f)(x)$ (3m)
b. Domain of function. (3m)

(a) $(g \circ f)(x) = g(f(x)) = \frac{2}{\frac{3}{2x+1}} = \frac{2(2x+1)}{3} = \frac{4x+2}{3}$
(b) domain for $f(x)$ is $x \neq -\frac{1}{2}$
domain for $g(x)$ is $x \neq 0$
So is a real number except $-\frac{1}{2}$ and 0

Question 4

[3 Marks]

Given an arithmetic sequence 5, 37/7, 39/7, 41/7

- a. Find the sequence recursive formula (1m)
b. Write a Pseudo-code for function $a(n)$ (2m)

(a) $a_n = a_{n-1} + \frac{2}{7}, n \geq 1$

(b) $a(n)$ {
if $(n=1)$
return 5;
return $a(n-1) + \frac{2}{7}$;
}