

EXAM 4 – Retake (duration: 25 minutes)

DatZ1143: Discrete mathematics for computing

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Name and surname:

Student number:

Date:

Questions

(There are 8 questions. Total is 10 points.)

1. Write down all subsets of the set $\{2, 4, 8\}$. (1 point)

2. Let $A = \{2, 4, 6, 8, 10, 12, 14\}$ and $B = \{3, 6, 9, 12, 15\}$.

2.a) List the members of the set $A \cap B$: (1 point)

2.b) List the members of the set $A \cup B$: (1 point)

3. Let $f(x) = 3x - 3$ and $g(x) = 4x - 4$ be two functions from integers to integers. Calculate the value of $(g \circ f)(1)$ and the value of $(f \circ g)(1)$. (2 points)

4. Let $f(a) = \lceil \frac{a}{4} \rceil$ be a function from integers to integers. Calculate the value of $f(-4) + f(-2) + f(0) + f(2) + f(4)$. (1 point)
5. Let $g(b) = \lfloor \frac{b}{4} \rfloor$ be a function from integers to integers. Calculate the value of $g(-4) + g(-2) + g(0) + g(2) + g(4)$. (1 point)
6. Give an example of function from integers to integers which is not one-to-one? Explain why it is not one-to-one. (1 point)
7. Give an example of function from integers to integers which is not onto? Explain why it is not onto. (1 point)
8. Let $h(x) = ax^2 + bx + c$ be a function from real numbers to real numbers. Write down a triple of (a, b, c) for which $h(x)$ is invertible. (1 point)