

EXAM 5 (duration: 25 minutes)

DatZ1143: Discrete mathematics for computing

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Name and surname:

Student number:

Date:

Questions

(There are 4 questions, 10 points in total.)

It is given that $\sum_{j=1}^n j = \frac{n(n+1)}{2}$.

$\{a_n\}$ is a sequence such that $a_n = 3n + 1$, where $n \geq 1$.

$\{b_n\}$ is a sequence such that $b_n = b_{n-1} + b_{n-2}$, where $b_1 = -1$ and $b_2 = 0$

1. What are the first five terms of $\{a_n\}$? (1 point)

2. What are the values of b_6 , b_7 , and b_8 ? (3 points)

3. Calculate the summation $\sum_{i=1}^{20} a_i = a_1 + a_2 + \cdots + a_{20}$. Your final answer should be a single integer. (3 points)

4. Calculate the following **infinite** summation:

$$4^2 + 4^1 + 4^0 + \frac{1}{4^1} + \frac{1}{4^2} + \frac{1}{4^3} + \cdots + \frac{1}{4^n} + \cdots .$$

Your final answer should be either a single number or the summation of two numbers.
(3 points)