Exam 2/4 Math for AI-I, 25.11.22

Q 1-4 :

Find inf and min (or sup and max) if they exist.
2 questions of finding it for a set.

i.e. find inf(A) and min(A) if they exist for A=(3, 10]

2 questions of finding it for a f(x).

1. $f(x) = \left\{ 3\frac{(-1)^{n+1}}{n+1} : n \in \mathbb{N} \right\}$
2. $f(x) = \frac{1}{n+2} - 3$

Q5:

There is a set of numbers {1,2,3,...,9}. How many possibilities are there to take 6 elements out of it?

Q6:

Choose a domain for which the function is injective:

$f(x) = (x-1)^2$ (-3,3) , or [0,3] or [-3,0]

$$f(x) = \begin{cases} 0 & x \leq 0 \\ x & x > 0 \end{cases}$$ (-3,3) , or [0,3] or [-3,0]

Q7:

Prove by induction:

$$\sum_{i=1}^{n} i(i+1) = \frac{n(n+1)(n+2)}{3}$$