

MA 355 Homework 3

#1 Find the interior of the following sets:

- (i) $\left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$
- (ii) $[0, 3] \cup (3, 5)$
- (iii) $[0, 2] \cap [2, 4]$

#2 Classify the following sets as open, closed or neither:

- (i) $\left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$
- (ii) \mathbb{N}
- (iii) $\{x : x^2 > 0\}$

#3 Find the closure of the sets

- (i) $\left\{ \frac{1}{n} : n \in \mathbb{N} \right\}$
- (ii) \mathbb{N}
- (iii) $\{x : x^2 > 0\}$

#4 Show \emptyset is both open and closed.

#5 Show $cl(S \cap T) \subset cl(S) \cap cl(T)$.

#6 If $B_n = \cup_{i=1}^n A_i$, prove that $\cup_{i=1}^n \bar{A}_i \subset \bar{B}_n$.

#7 Let E^o denote the set of all interior points of a set E . Prove that E is open iff $E^o = E$.

#8 If x is a limit point of a set S , then every neighborhood of x contains infinitely many points.