

Problem Sequence - Problems

This document contains the problems that we are given throughout the course.

Problem 1 *Show that if M is the set which contains only the number 0, and p is a point, then p is not a limit point of M .*

Problem 2 *Show that if M is the point set that contains only the two points 0 and 1, then no point is a limit point of M .*

Problem 3 *Show that 1 is a limit point of the segment $(0,1)$.*

Problem 4 *Show that a and b are limit points of the segment (a,b) .*

Problem 5 *If S is the segment (a,b) , show that every point of S is a limit point of S .*

Problem 6 *Show that if M is an interval and p is a point not in M , then p is not a limit point of M .*

Problem 7 *Show that if H is a point set, and K is a point set, and $H \subseteq K$, and p is a limit point of H , then p is a limit point of K .*

Problem 8 *Show that if M is the set of all positive integers and p is a point, then p is not a limit point of M .*

Problem 9 *Show that if p is a limit point of the point set M and S is a segment containing p , then S contains 2 points of M .*

Problem 10 *Let H be a point set which has a limit point, and let K be the set of all limit points of H . Show that if p is a limit point of K , then p is also a limit point of H .*

Problem 11 *Show that if M is the set of all reciprocals of positive integers, then 0 is a limit point of M .*

Problem 12 *Show that if $p \neq 0$, then p is not a limit point of the set of all reciprocals of positive integers.*

Problem 13 *if H and K are two point sets having a common point, and p is a limit point of $H \cap K$, then p is a limit point of H and p is a limit point of K .*

Problem 14 *Suppose that M is a point set and p is a limit point of M . Must it be true that every interval containing p contains a point of M different from p ?*

Problem 15 *Suppose that M is a point set and every interval containing p contains a point of M different from p . Must it be true that p is a limit point of M ?*

Problem 16 *Show that if the point p is in each of the two segments S_1 and S_2 , then $S_1 \cap S_2$ is a segment containing p .*

Problem 17 *Show that if p is not a limit point of the point set H and p is not a limit point of the point set K , then p is not a limit point of $H \cup K$.*

Problem 18 *Show that if H and K are two point sets and p is a limit point of $H \cup K$, then p is a limit point of H or p is a limit point of K .*