

Problem of the Week

Week 7, due Oct 14th 11.59pm

NAME: _____
NAU Email: _____
Instructor: _____

Please write clean, neat and complete solutions to the problem in order to receive full credit. Your job is to convince me, or really anybody who reads this document, that you understand the problem and are able to communicate what you are thinking about. Please submit your solutions through Gradescope(<https://www.gradescope.com/>) by the indicated deadline. You might need to create an account with your NAU email. To enroll into the Problem of the Week course use entry code: NYZ56P. Good luck and have fun!

PROBLEM. It's not about how hard you hit. It's about how hard you can get hit and keep moving forward.

Let \mathcal{P} be a finite set of points in the plane and let \mathcal{L} be a set of all lines that pass through at least two points in \mathcal{P} . Among all pairs (P, l) for $P \in \mathcal{P}$, $l \in \mathcal{L}$ with P is not on l , choose a pair (P_0, l_0) such that P_0 has the smallest distance to l_0 . Prove that this line l_0 goes through exactly two points of \mathcal{P} . *Hint: Argue by contradiction*

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