

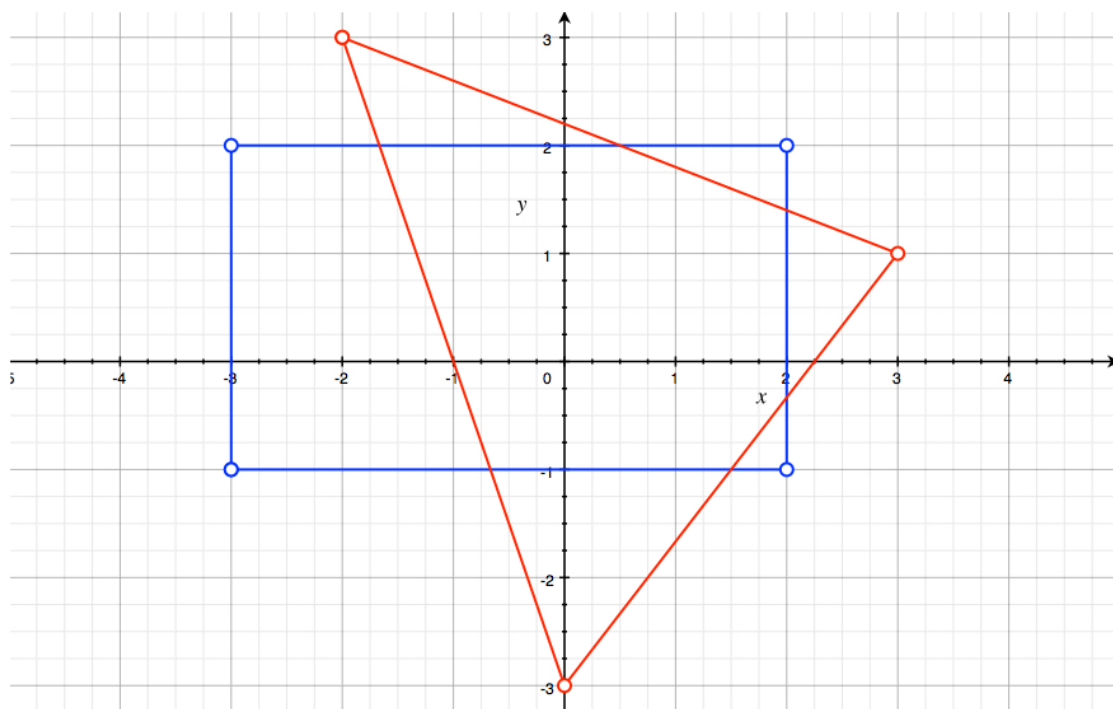


## CAS CS 585 Image and Video Computing - Spring 2021

Homework due date: 1 day before exam, which is **Wednesday, February 24, 9:30 am**, No late submissions accepted because solutions will be immediately published.

### Exercise 1: Hausdorff Distance

There are two shapes in the figure below. The triangle in red has three vertices: A(-2,3), B(3,1), and C(0,-3). The rectangle in blue has four vertices: D(-3,2), E(2,2), F(2,-1), and G(-3,-1).



1. Consider two point sets  $S_1$  and  $S_2$ , where  $S_1 = \{A, B, C\}$  and  $S_2 = \{D, E, F, G\}$ . Calculate the Hausdorff distance between these two point sets.
2. Now consider all the points forming these two polygons. What's the Hausdorff distance between the triangle and the rectangle?

### Exercise 2: Segmentation

The following tables include all the local maxima and local minima of the grayscale histogram of an image.

Table 1: Local Maxima

Gray Values	52	54	103	231
# of Pixels	1000	1170	1750	1300

Table 2: Local Minima

<b>Gray Values</b>	0	53	75	157	255
<b># of Pixels</b>	500	890	240	190	310

Calculate the highest peakiness and the corresponding threshold using Mode Method.

### **Programming Assignment on Segmentation**

The programming component of this homework will be published after the exam due date.