Dataset has n=10 points: the The Labels Model's predictions for the 10 points (with threshold 0.5): Accuracy: 7/10 " of all 5 positive predictions, Precision: $\frac{TP}{TP+FP} = \frac{4}{4+1} = 4/5$ 4 are actually positive" " of all 6 actually positive points, $\operatorname{Recall}: \frac{TP}{TP+FN} = \frac{4}{4+2} = \frac{4}{16}$ 4 were predicted presitive " If we increase the threshold, we will predict less points as positive. Thus, we should expect that it we predict as positive it's probably positive (since we are "increasing the barrier to entry " as you said in OH). Thus, the precision increases. Mathematically, you can think of this as TP increasing and FP decreasing.

Similarly, when the threshold increases, we should expect that some points that we predict as negative are actually positive, since the barrier to entry "for a positive prediction is high. Thus, recall decreases. Mathematically, you can think of this as FN increasing by more than TP.

Putting this together, we can see that there is some tradeoff between precision and recall. But remember that precision is not a function of recall (and vice versa). Both precision and recall are functions of the threshold.

Note: What I've written is the <u>expected</u> relationship between precision and recall. The assumption here is that the classifier in question is actually sensitive to the threshold. If the classifier's prediction's don't change as the threshold changes, then the precision and recall are not affected by the threshold changing.