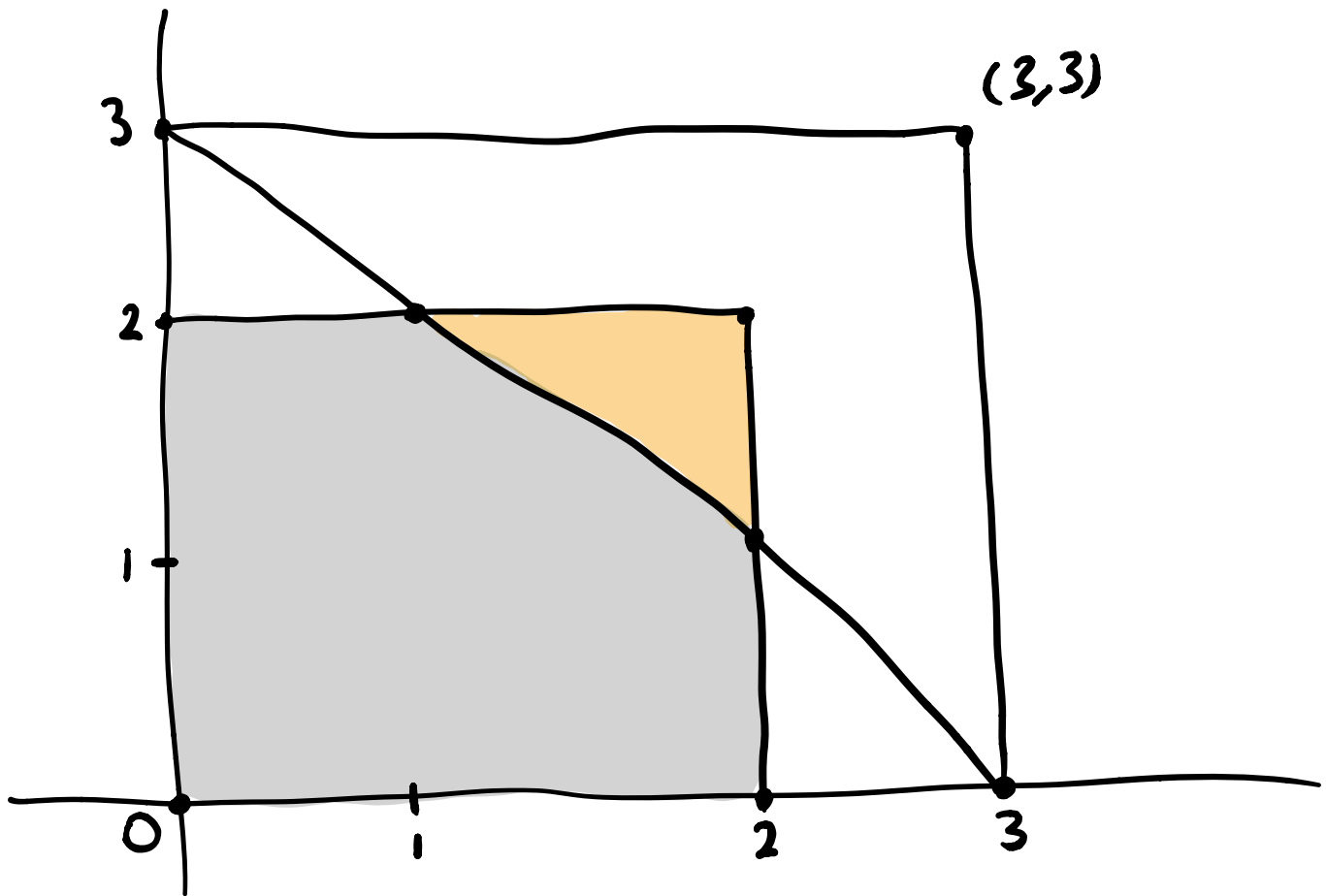


A point is chosen at random inside the square with vertices $(0,0)$, $(2,0)$, $(2,2)$, $(0,2)$. What is the probability that this point is closer to $(0,0)$ than $(3,3)$?



The line from $(3,0)$ to $(0,3)$ represents the points equidistant from $(0,0)$ and $(3,3)$. So the area of the grey region divided by the area of the square is the required probability.

$$\text{Area of square} = 2 \times 2 = 4$$

Intersection of line $x+y=3$ with the lines $x=2$ and $y=2$?

$$x=2 \Rightarrow 2+y=3 \Rightarrow y=1$$

$$y=2 \Rightarrow x+2=3 \Rightarrow x=1$$

$$\text{Area of orange region} = \frac{1}{2} \times 1 \times 1 = \frac{1}{2}$$

$$\text{So area of grey region} = 4 - \frac{1}{2} = 3.5$$

$$\therefore \text{Required probability} = \frac{3.5}{4} = 0.875$$