

Stat 134: Section 10

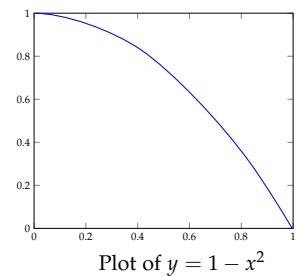
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Problem 1

Pick a uniformly chosen random point inside the sector delimited by the x -axis, the y -axis and the parabola given by the equation $y = 1 - x^2$.

- Verify that the area of that sector is $2/3$.
- What is the probability that the distance of this point to the y -axis is **less** than $1/2$?
- What is the probability that the distance of this point to the origin is **more** than $1/2$?



Problem 2

Suppose X with values in $(0, 1)$ has density $f(x) = cx^2(1 - x)^2$ for $0 < x < 1$. Find

- the constant c .
- $\mathbb{E}[X]$.
- $\mathbb{V}[X]$.

Ex 4.1.4 in Pitman's Probability

Problem 3

Let X be a random variable that has a uniform distribution on the interval $(0, a)$.

- a. Find the c.d.f. of $Y = \min(X, a/2)$.
- b. Is the distribution of Y continuous? Explain.
- c. Find $\mathbb{E}[Y]$.

Ex 4.7.22 in Pitman's Probability