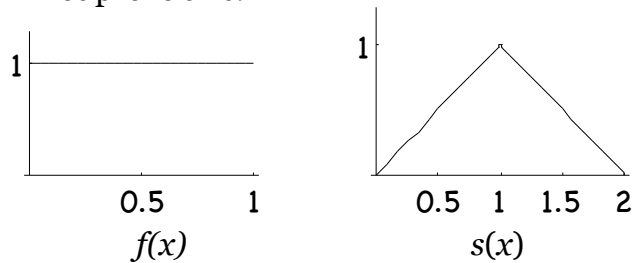


Homework 6

Due Wednesday, October 7

WMMY: Ch 4 #58*, 64, 69, 89
* Are X and Y independent?

Problem A: Recall that an ideal spinner has a uniform, continuous probability distribution $f(x)$ as shown on the left. If you spin twice to get random variables X and Y , then add the two results, you get the continuous distribution $s(x)$ shown on the right. However, we did not prove this.



Let's check that $s(x)$ has the correct mean and SD. Compute the mean and SD of s by integration, using the formulas for μ and σ .

Now compute the mean and SD of s using the fact that it is the distribution for $X + Y$. (You got the mean and SD of f in Hwk 5 prob D.) Your two computations should be the same.

Problem B: Larry Hughes is a career 75% free throw shooter. Let X be a random variable representing the number of free throws he makes given one shot. X is discrete with two possible values, 1 (with probability 0.75) and 0 (with probability 0.25).

Find the mean and standard deviation of X .

Suppose he takes 10 shots. Let X_1, X_2, \dots, X_{10} be the random variables representing the number he makes on shot 1, 2, \dots , 10. Each X_i has the same distribution as X in the first part.

His total shots made is $T = X_1 + X_2 + \dots + X_{10}$. Assuming his free throws are independent, find $\mu(T)$ - his expected number of made free throws, and find the standard deviation $\sigma(T)$.

His percentage made is $P = T/10$. Find $\mu(P)$ and $\sigma(P)$.