INTRODUCTION TO CALCULUS

MATH 1A

UNIT 23: WORKSHEET

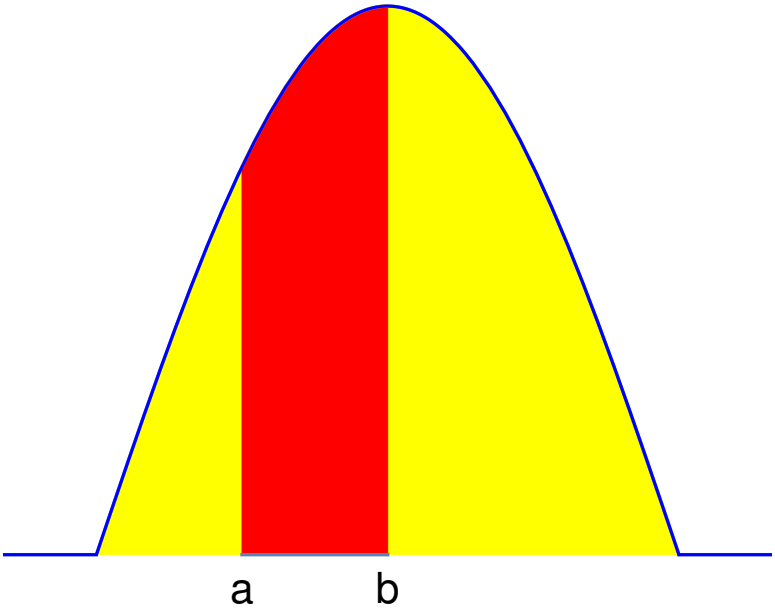
PDF and CDF

1: Find the cumulative distribution function

$$F(x) = \int_{-\infty}^{x} f(t)\, dt\ .$$

of the exponential distribution in the case $f(x) = 2\exp(-2x)$ for $x \geq 0$. The function is 0 for negative x.

2: Let us look at the function which is $f(x) = \sin(x)/2$ on the interval $[0, \pi]$ and which is zero everywhere else. You see the function in the picture. Verify that this is a **probability distribution**.



3: What is the cumulative distribution function $F(x)$ of the same function

$$f(x) = \sin(x)/2 \ .$$

Remember that the function is defined to be zero for x outside the interval $[0, \pi]$.

4: What is the probability $\int_a^b f(x)\ dx$ of the event

$$[a, b] = [\pi/4, \pi/2] \ .$$

We again use the same function $f(x) = \sin(x)/2$ supported on the interval $[0, \pi]$. Verify that this is $F(\pi/2) - F(\pi/4)$.