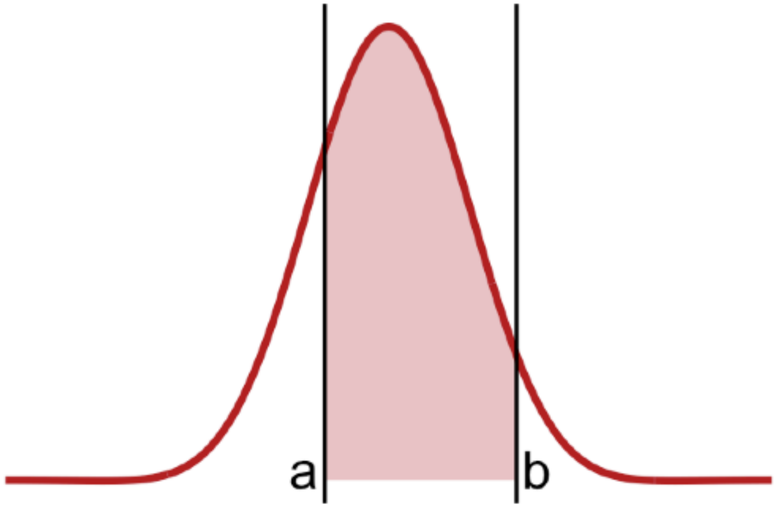
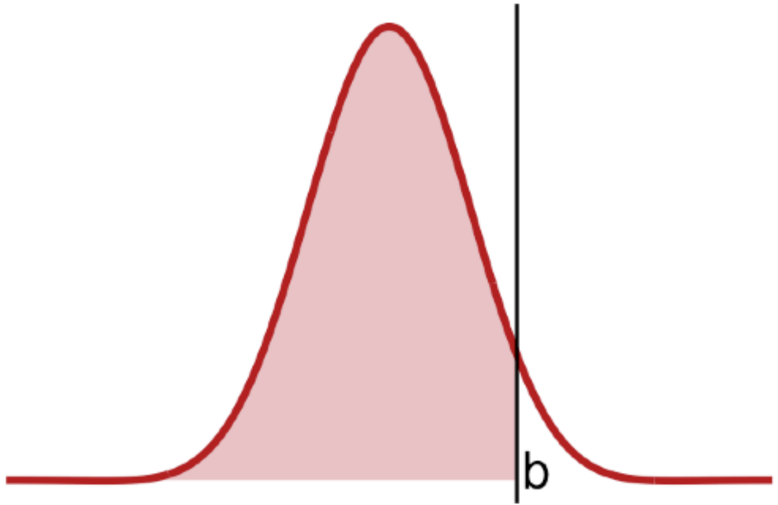
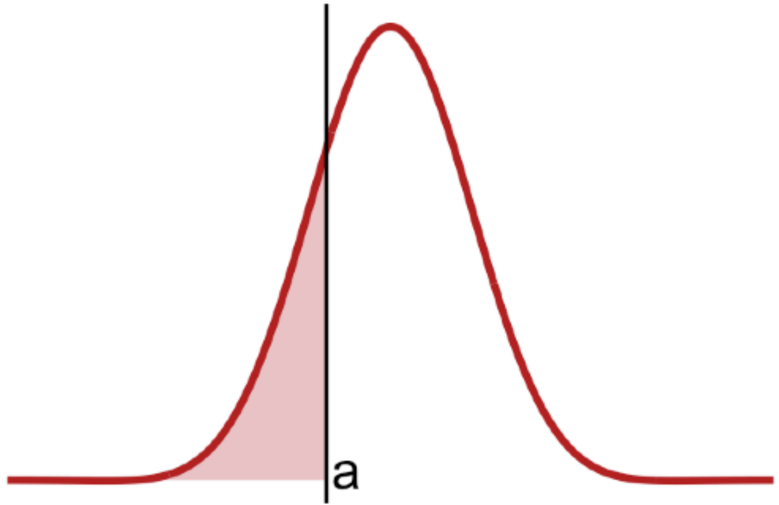
computing probabilities with cdf


a
b


b


a

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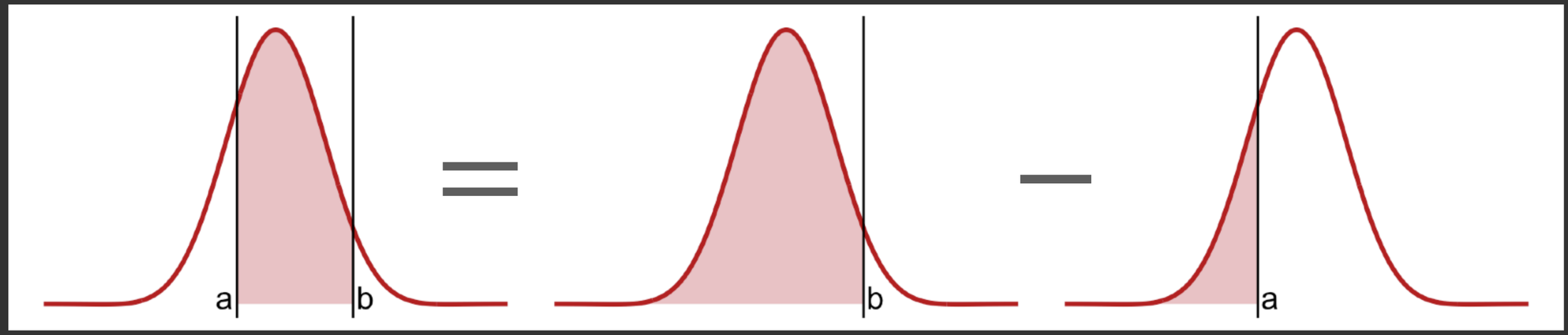
Let X be a continuous random variable with pdf $f(x)$ and cdf $F(x)$. Then for any value a we have that

$$P(X \leq a) = F(a) \quad P(X > a) = 1 - F(a)$$

and for any two values $a < b$

$$P(a \leq X \leq b) = F(b) - F(a)$$



computing probabilities with cdf

exercise 3

Random variable T is distributed with the following probability density function:

$$f(t) = \begin{cases} ct(t-1) & \text{for } 0 \leq t \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

(a) Calculate the value of c.

(b) Calculate the cumulative distribution function $F(t)$.

(c) Use the cdf $F(t)$ to calculate $P(1/3 \leq T \leq 2/3)$.