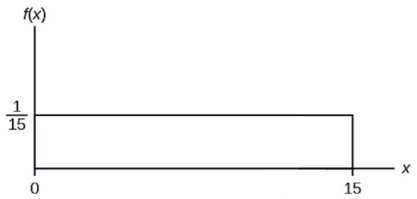
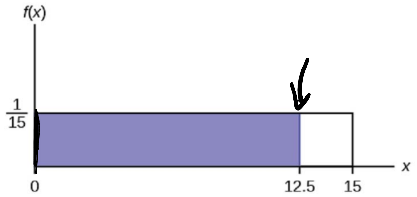
Section 5.2

Example Suppose you have a probability distribution function $f(x) = \frac{1}{15}$, for $0 \leq x \leq 15$. The curve and area for this distribution is below:



What is the total area under $f(x)$?

Example Suppose you have a probability distribution function $f(x) = \frac{1}{15}$, for $0 \leq x \leq 15$. The curve and area for this distribution is below:



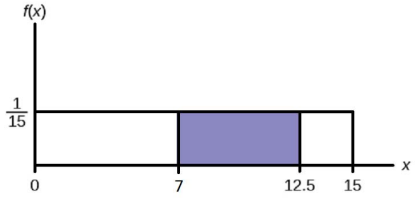
$P(x \leq 12.5)$

$P(x < 12.5) = (12.5 - 0)\frac{1}{15}$

$= .8333$

What is the area under $f(x)$, between 0 and 12.5?

Example Suppose you have a probability distribution function $f(x) = \frac{1}{15}$, for $0 \leq x \leq 15$. The curve and area for this distribution is below:



$P(7 \leq x \leq 12.5) = (12.5 - 7) \cdot \frac{1}{15} = .3667$

What is the area under $f(x)$, between 7 and 12.5?

Section 5.3

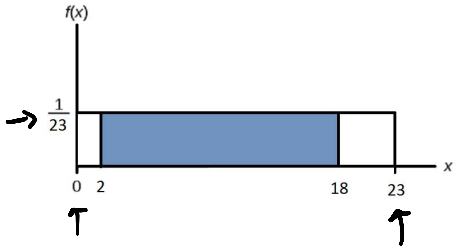
Example Consider the following data given in the spreadsheet:

10.4, 19.6, 18.8, 13.9, 17.8, 16.8, 21.6, 17.9, 12.5, 11.1, 4.9, 12.8, 14.8, 22.8, 20, 15.9, 16.3, 13.4, 17.1, 14.5, 19, 22.8, 1.3, 0.7, 8.9, 11.9, 10.9, 7.3, 5.9, 3.7, 17.9, 19.2, 9.8, 5.8, 6.9, 2.6, 5.8, 21.7, 11.8, 3.4, 2.1, 4.5, 6.3, 10.7, 8.9, 9.4, 9.4, 7.6, 10, 3.3, 6.7, 7.8, 11.6, 13.8, 18.6

The mean of the data is 11.65 and the histogram is approximately uniform. The range of the data: $U(0, 23)$ so if the distribution is uniform, $f(x) = \frac{1}{23-0} = \frac{1}{23}$, and the distribution is given below.

min max

$f(x) = \frac{1}{b-a}$



- Find $P(2 \leq x \leq 18)$. $= (18-2)\frac{1}{23} = \frac{18-2}{23} = .6957$

- How many of the smile times in the data fit in that interval.

43 data values between 2 and 18 seconds $\quad \frac{43}{55} = .78$

- Find the 90th percentile for an eight week old baby's smiling time.

$.9 = (P-0) \cdot \frac{1}{23}$

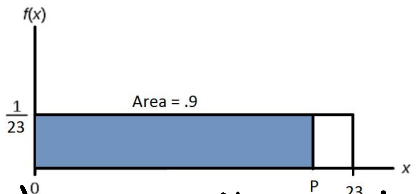
$P = 20.7$ sec.

min

$\mu = \frac{a+b}{2} = \frac{23}{2} = 11.5$

$\sigma = \sqrt{\frac{(b-a)^2}{12}} = \sqrt{\frac{(23-0)^2}{12}}$

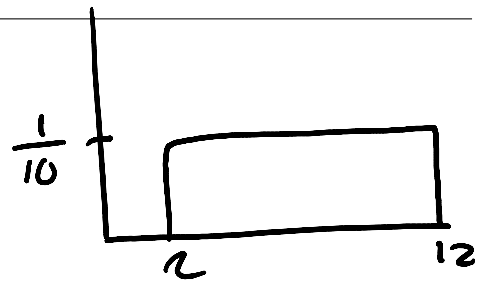
$= 6.6395$



90% of all baby smiling times are at most 20.7 sec.

Conditional Probabilities in the uniform distribution

$U(2,12)$



Calculate $P(x<6 \mid x<8)$

$= (6-2) \cdot \frac{1}{6} = .6667$