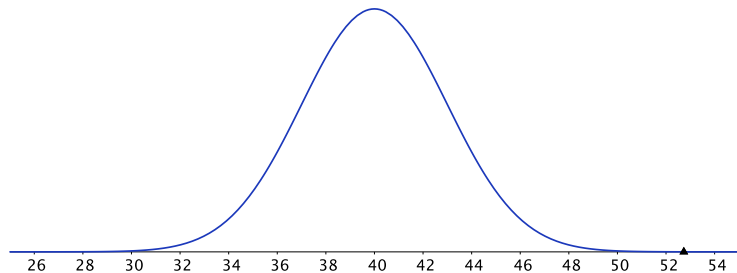


# Some notes from class

2018-02-23

# A probability density function $f(x)$

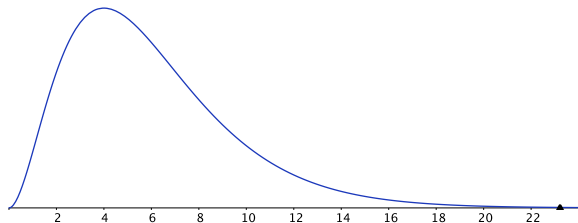
This is a picture of a probability density function  $f(x)$ .



Imagine that  $x$  represents the number of weekly hours spent studying by WSU students.

# A probability density function $f(x)$

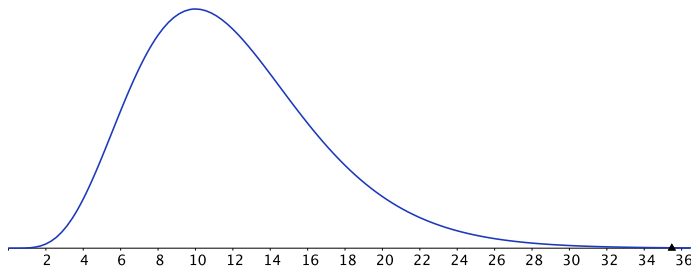
This is a picture of a probability density function  $f(x)$ .



Imagine that  $x$  represents the number of daily hours spent studying by WSU students.

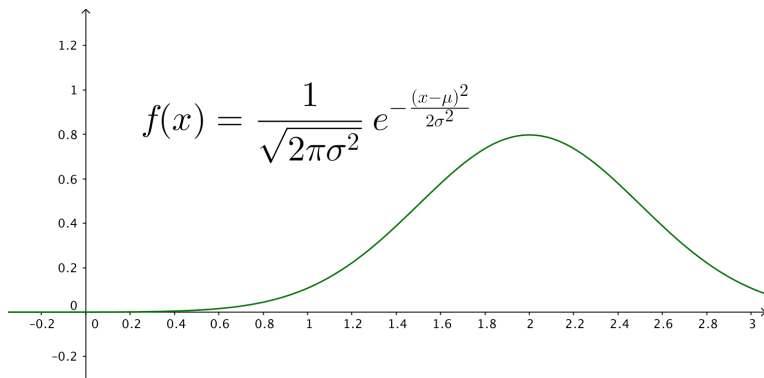
# A probability density function $f(x)$

This is a picture of a probability density function  $f(x)$ .



Imagine that  $x$  represents the amount of time (in minutes) spent waiting to talk to a customer service representative.

# A probability density function $f(x)$



- 1  $f(2) = 0.798$  **does not** mean there's a 79.8% chance  $x = 2$ .
- 2  $f(2) > f(1.4)$  sort of means that  $x$ -values near 2 are more likely than ones near 1.4.
- 3 The **key issue is area**.  $P(2.2 \leq x \leq 2.6) =$  the area under  $f(x)$  from  $x = 2.2$  to  $x = 2.6$ .

# What makes something a density function?

A function  $f(x)$  is a *probability density function* if

①  $f(x) \geq 0$  for all  $x$ ,

②  $\int_{-\infty}^{\infty} f(x) dx = 1$ ,

③  $P(a \leq x \leq b) = \int_a^b f(x) dx$ .