Slide 27 Worked Example

Based on data from the Spring 2017 semester, the mean amount spent on textbooks for the semester is $405.17 with standard deviation $210.59. Suppose I have a random sample of 50 students. What is the probability that the sample mean is more than $400?

For $n = 50$, $\bar{x}_{n=50} \sim N(405.17, \frac{210.59}{\sqrt{50}} = 29.782)$. Therefore,

$$
\begin{aligned}
P(\bar{x}_{n=50} > 400) &= P(Z > \frac{400 - 405.17}{29.782}) \\
&= P(Z > -0.1736) \\
&= 1 - pnorm(-0.1736) \\
&= 0.5689
\end{aligned}
$$