First, we need to figure out the test.

By Theorem 6.2.1, the test is given by

\[ z = \left| \frac{\bar{y} - 60}{4/\sqrt{16}} \right| \geq 1.96 \]

Move all the constants to the other side \( \bar{y} \geq 61.96 \) or \( \bar{y} \leq 58.04 \)

Always keep in mind the distribution of the test statistic

\( \bar{y} \sim \mathcal{N}(\mu, 1) \)

The power of any \( \mu \neq 60 \) is given by

\[ \mathbb{P}_\mu \{ \bar{y} \geq 61.96 \} + \mathbb{P}_\mu \{ \bar{y} \leq 58.04 \} = 1 - \Phi(61.96 - \mu) + \Phi(58.04 - \mu) \]

And that looks like the following curve:
6.4.4

First, we need to figure out the test.

By Theorem 6.2.1, the test is given by

\[ z = \frac{\bar{y} - 240}{50/\sqrt{25}} \leq -1.65 \]

Move all the constants to the other side \( \bar{y} \leq 223.5 \)

Test statistic

\( \bar{y} \sim N(\mu, 100) \)

The expected type II error at \( \mu = 220 \) is given by

\[ P_{\mu=220}\{\bar{y} \geq 223.5\} = 1 - \Phi\left(\frac{223.5 - 220}{10}\right) = 0.363 \]