3. What is the value of my *z* test statistic in this example?

   A:
   $$z = \frac{\bar{x} - \mu}{\sigma_{\text{x-bar}}}$$

   and
   $$\sigma_{\text{x-bar}} = \frac{\sigma}{\sqrt{N}}$$

   So, let's first get the standard error of the mean:
   $$\begin{aligned}
   \sigma_{\text{x-bar}} &= 15 / \sqrt{\text{N}} \\
   &= 15 / \sqrt{36} \\
   &= \frac{15}{6} \\
   &= 2.50 \\
   &= \frac{90 - 80}{2.50} \\
   z &= \frac{10}{2.50} \\
   z &= +4.00
   \end{aligned}$$

4. Do I reject or fail to reject the null hypothesis? What does this mean in plain English?

   A: Because the test statistic of $z = +4.00$ is greater than the critical value of +1.89, the test statistic of +4.00 falls in the region of null hypothesis rejection, so I reject the null hypothesis. This means it appears my current class did better than the historical mean on this exam.

5. Write this result in proper APA style.

   A: $z\ (N = 36) = 4.00,\ p < .03$ (one-tailed)