

2. A survey compared the ACT scores of 1000 randomly selected students nationwide to those of 500 randomly selected students from Ohio. Using $\alpha = 0.05$, can we support the claim that mean score from Ohio is below the national average? Assume that the population standard deviation in each case is 3. (26 points)

Nationwide scores

$$\bar{X}_1 = 21.4$$

$$\sigma_1 = 3$$

$$n_1 = 1000$$

Ohio scores

$$\bar{X}_2 = 20.8$$

$$\sigma_2 = 3$$

$$n_2 = 500$$

Step 1: State the hypotheses and identify the claim

$$H_0 :$$

$$H_1 :$$

Step 2: Find the critical value(s)

$$\text{C.V.} =$$

Step 3: Compute the test value

Step 4: Determine whether to reject the null (circle the correct phrase)

Reject H_0 .

Don't reject H_0 .

Step 5: Summarize the results (circle the correct terms.)

We **do** have sufficient evidence to **reject** the claim.
We **don't** have sufficient evidence to **support** the claim.

